

CARDIOVASCULAR SYSTEM

**Great vessels of the thorax , abdomen & their surface
anatomy**

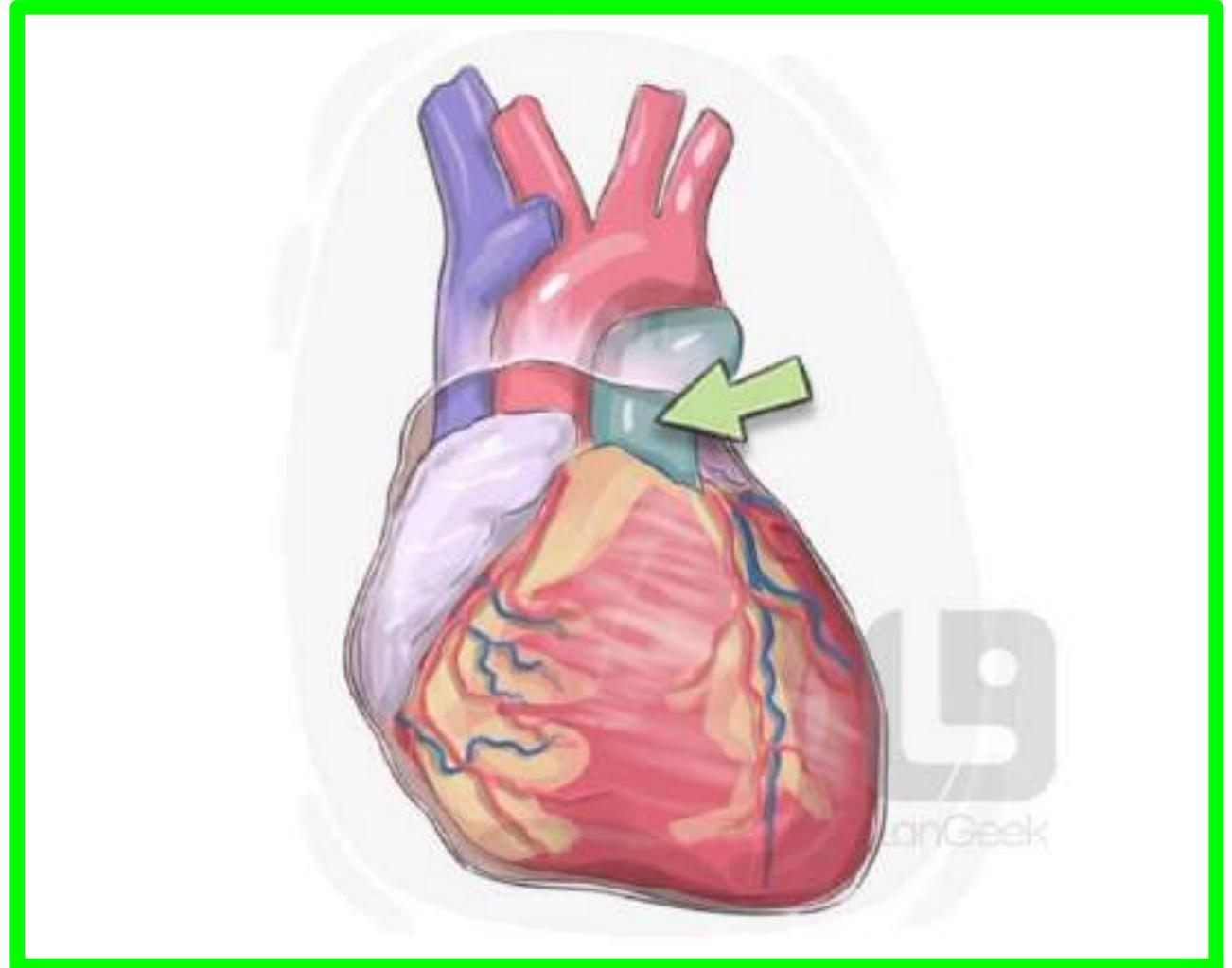
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College of Medicine /University Of Mutah
2025-2026

Thursday 13 November 2025

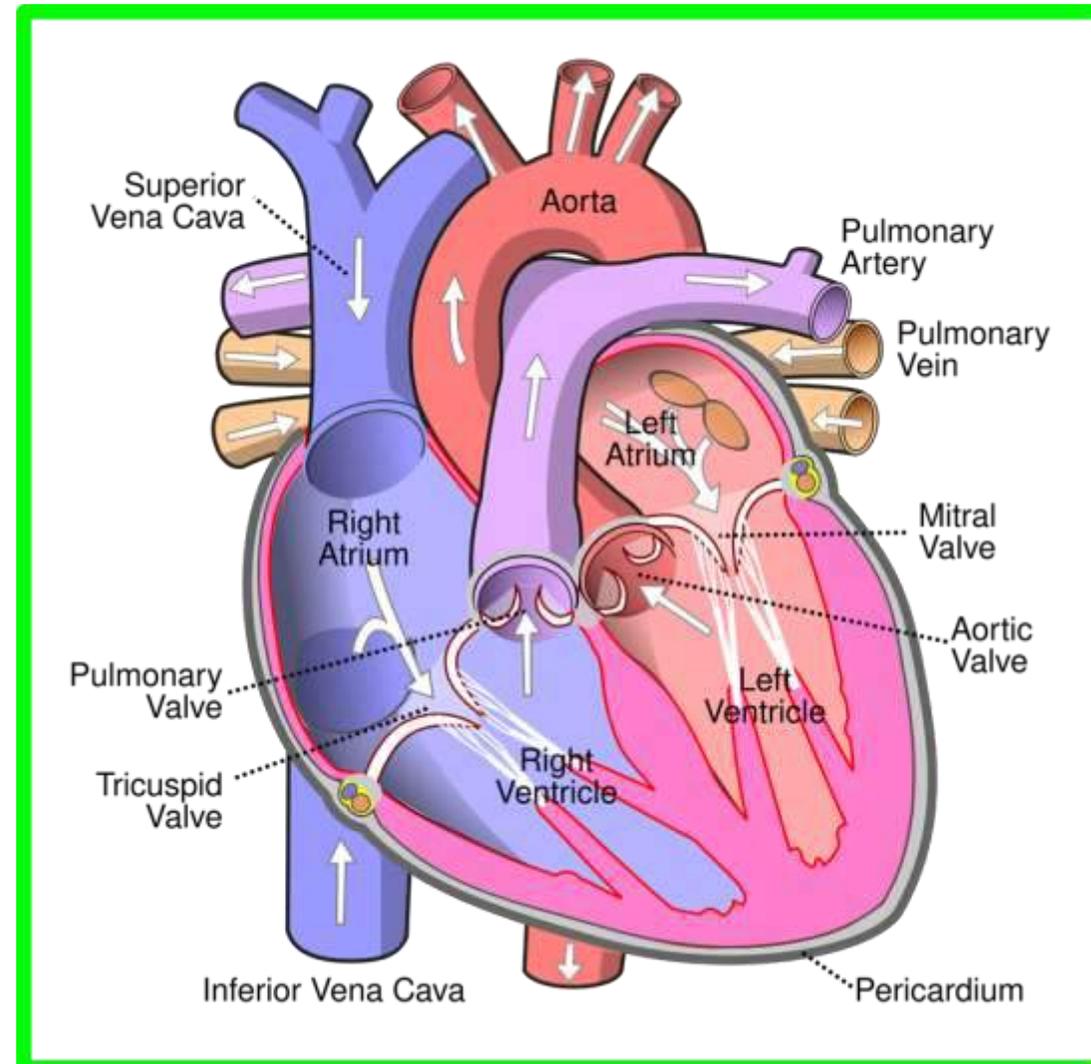
PULMONARY TRUNK

- ✓ The pulmonary trunk or (**artery**), conveys deoxygenated blood from the right ventricle to the lungs
- ✓ About **5 cm** in length and **3 cm** in diameter
- ✓ It is entirely within **the pericardium**, enclosed with the **ascending aorta** in a common tube of visceral pericardium



PULMONARY TRUNK

- ✓ **Origin:** from the **conus arteriosus** of the Rt. ventricle behind sternal end of Lt. 3rd costal cartilage
- ✓ **Course:** it passes upward backward to Lt. Winding around the Lt. Side of ascending aorta (begin 1st in front and then to the Lt. of ascnd. aorta)
- ✓ **Termination:** End immediately below the concavity of aortic arch at level **T4-T5 I.V. disc.**



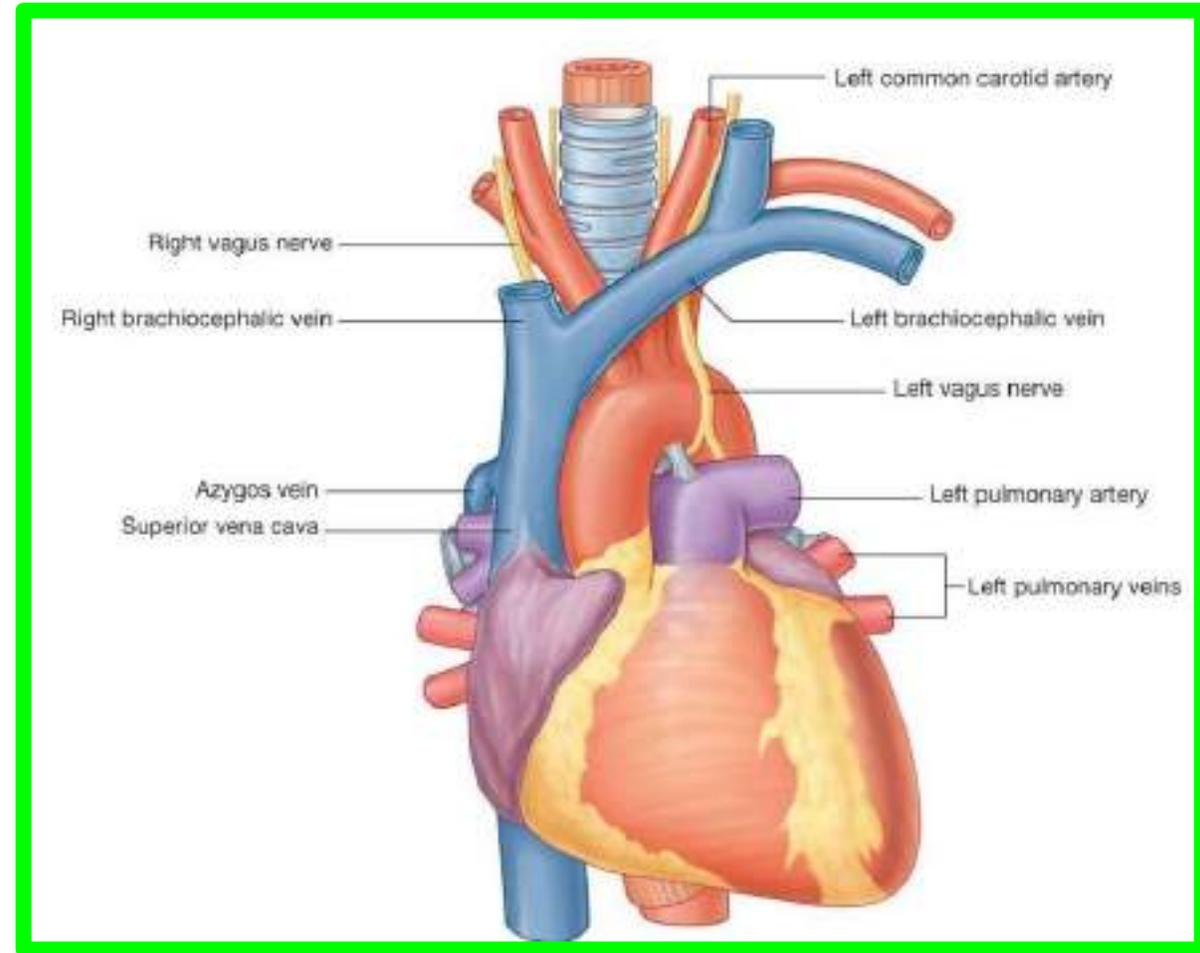
PULMONARY TRUNK

❖ The bifurcation lies in front of **esophagus** but separated from it by the **trachea**

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** It divides into:

- ✓ **Rt. pulmonary A:** which passes to the Rt. **posterior to the ascending aorta** and the **superior vena cava**, to enter the right lung.
- ✓ **Lt. pulmonary A:** which passes **inferiorly to the arch of the aorta** and **anteriorly to the descending aorta** to enter the left lung.

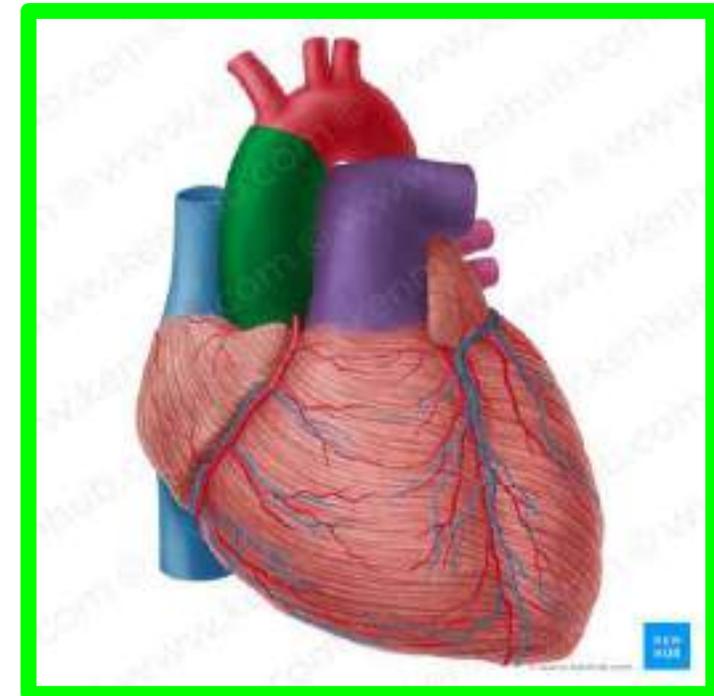
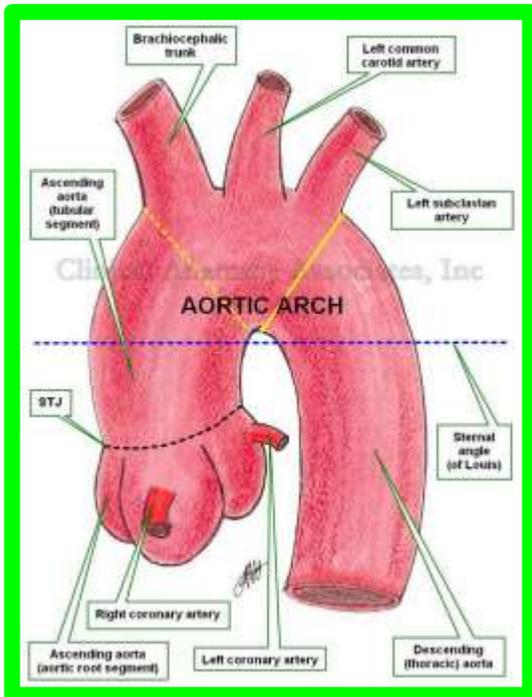


ASCENDING AORTA

**** Origin:** is 5 cm long arises from the **aortic vestibule** of Lt ventricle behind the Lt border of the sternum at the level of **Lt 3rd intercostal space**

**** Course:** Moving superiorly, slightly forward and to the right, then continues to the level of the **2nd Rt. costal cartilage**.

**** Termination:** Behind the **2nd Rt. Sternocostal junction** it enters the superior mediastinum and becoming **the arch of the aorta**.



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ASCENDING AORTA

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** Relation:

* On Rt. Side:

Above: SVC

Below: Rt. Auricle

* On Lt. side:

Above: Pulmonary trunk

Below: Lt. Auricle

* Anterior:

Above: Ant. Margin of Rt. Lung & pleura, thymus separating it from the sternum

Below:

*infundibulum of Rt. ventricle

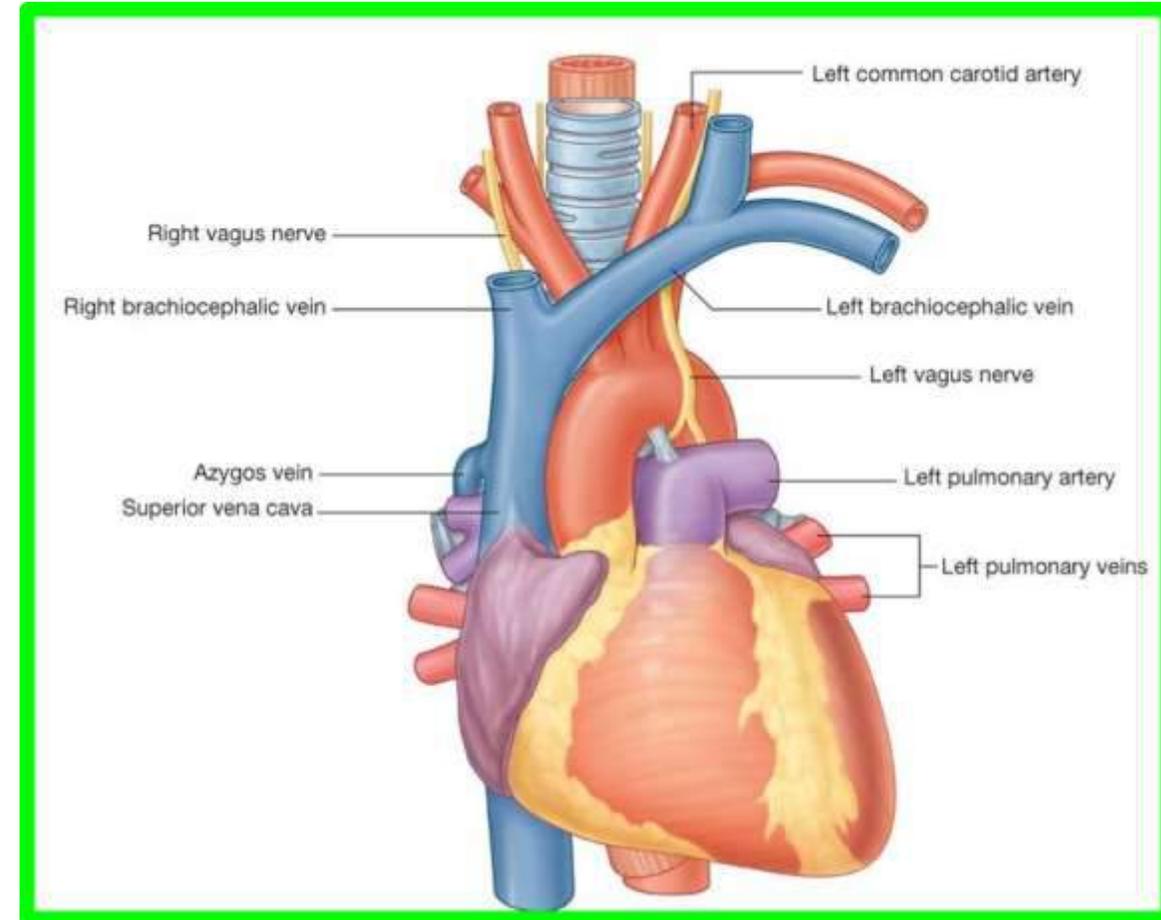
*Root of pulmonary Trunk

*Rt. auricle

* Posteriorly:

Above: Rt. Pulmonary artery separating it from Rt. Bronchus

Below: Transverse pericardial sinus separating it from 2 atria



ASCENDING AORTA

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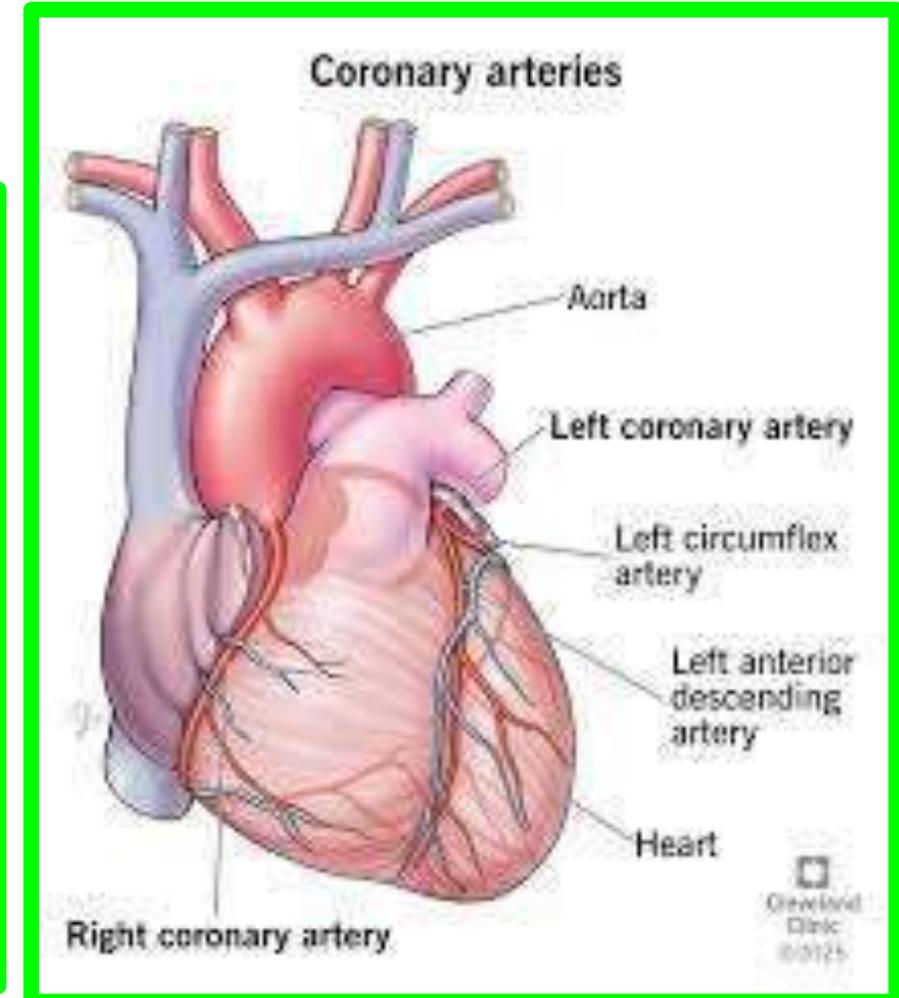
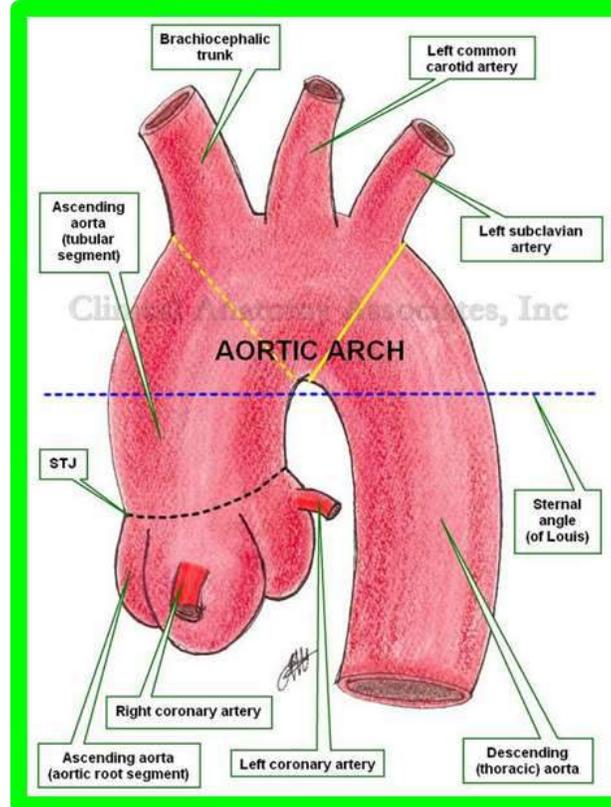
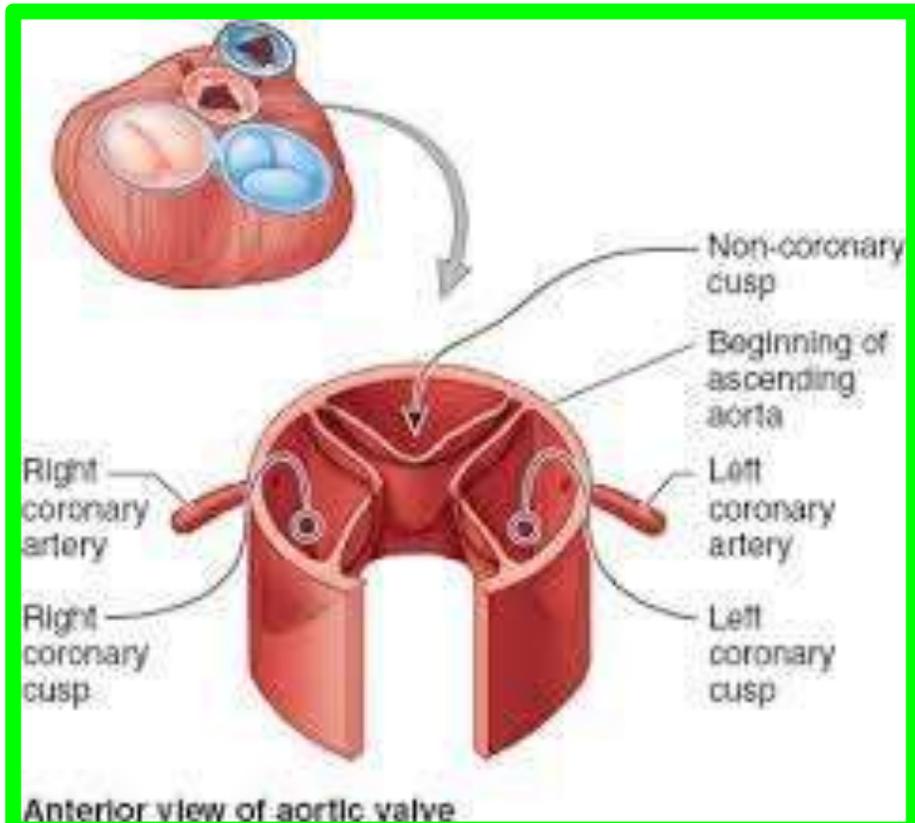
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**** Branches:** The right and left coronary arteries

The ascending aorta has 3 dilatations called aortic sinuses (Right , left & posterior aortic sinuses) lie Immediately above the 3 cusps of the aortic valve.

* Rt. Coronary artery arises from the right aortic sinus

* Left coronary artery arises from the left aortic sinus

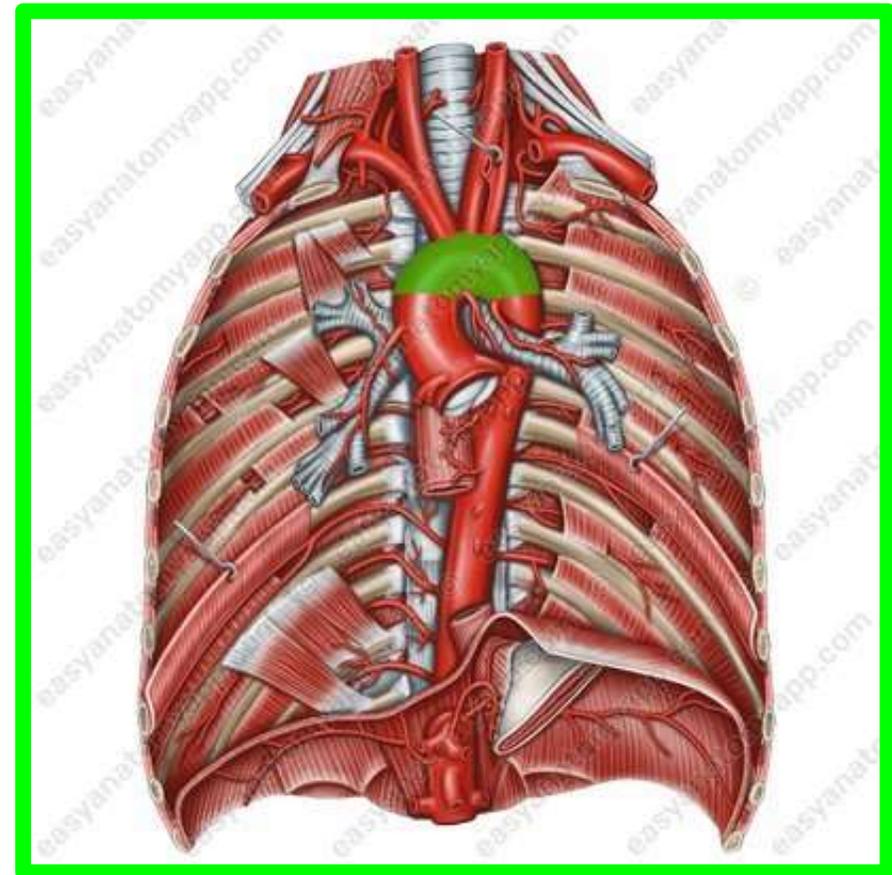
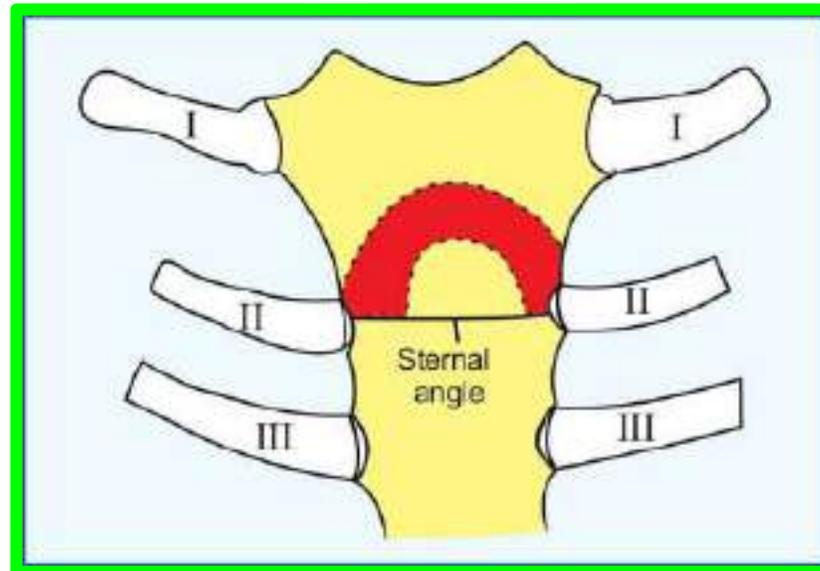


Arch of aorta

****Beginning:** Behind the **Rt. 2nd sternocostal junction** as a continuation of the ascending aorta.

****Course:** It run an arched course behind the **lower ½ of manubrium**

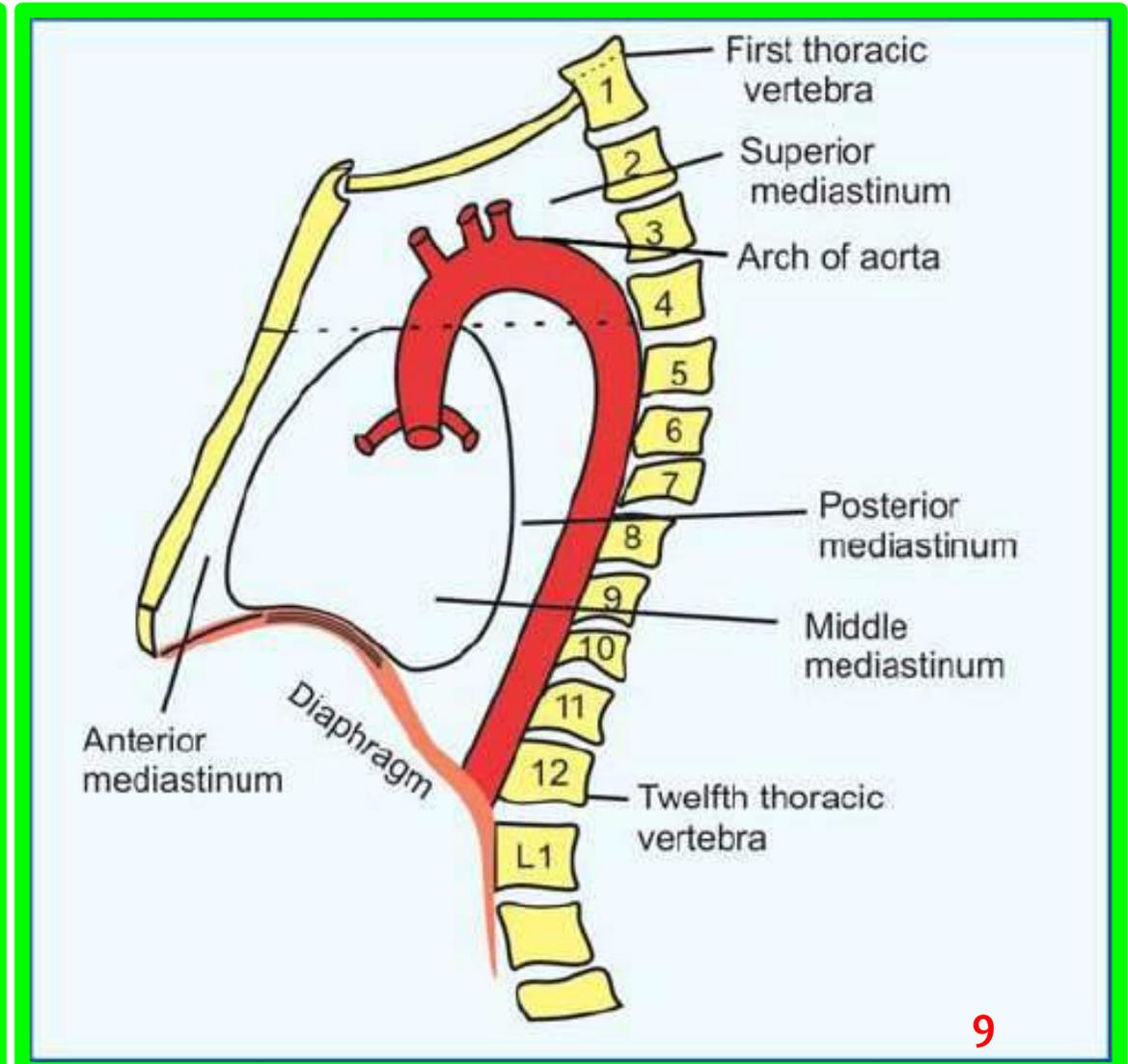
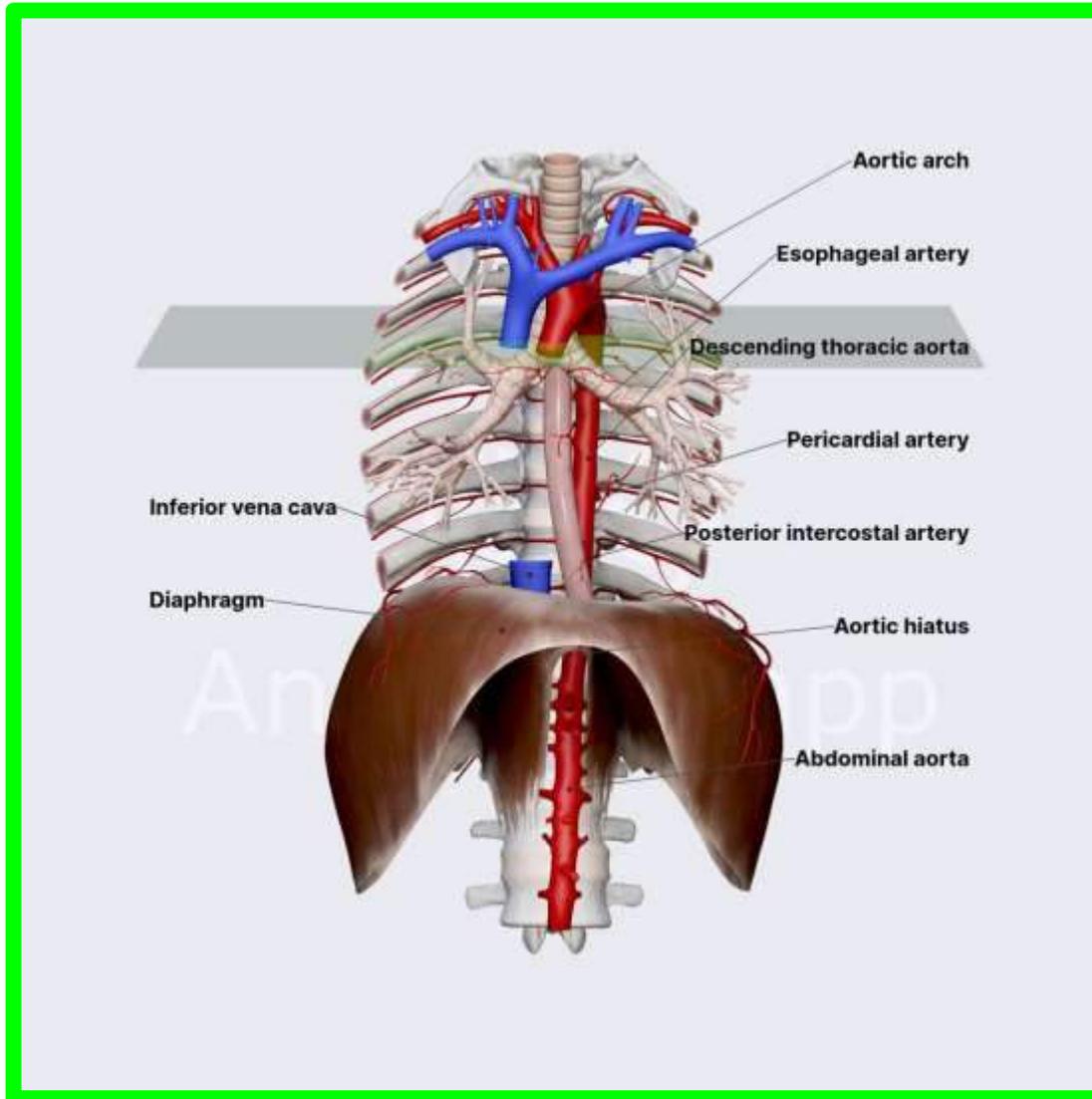
- It passes upward backward & to the Lt. then bend downwards
- During its course it present 2 curvatures:
 - ✓ One convex upward
 - ✓ Other convex anteriorly & to the left



Arch of aorta

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****Termination:** on the Lt side T4-T5 IV disc becoming the descending aorta



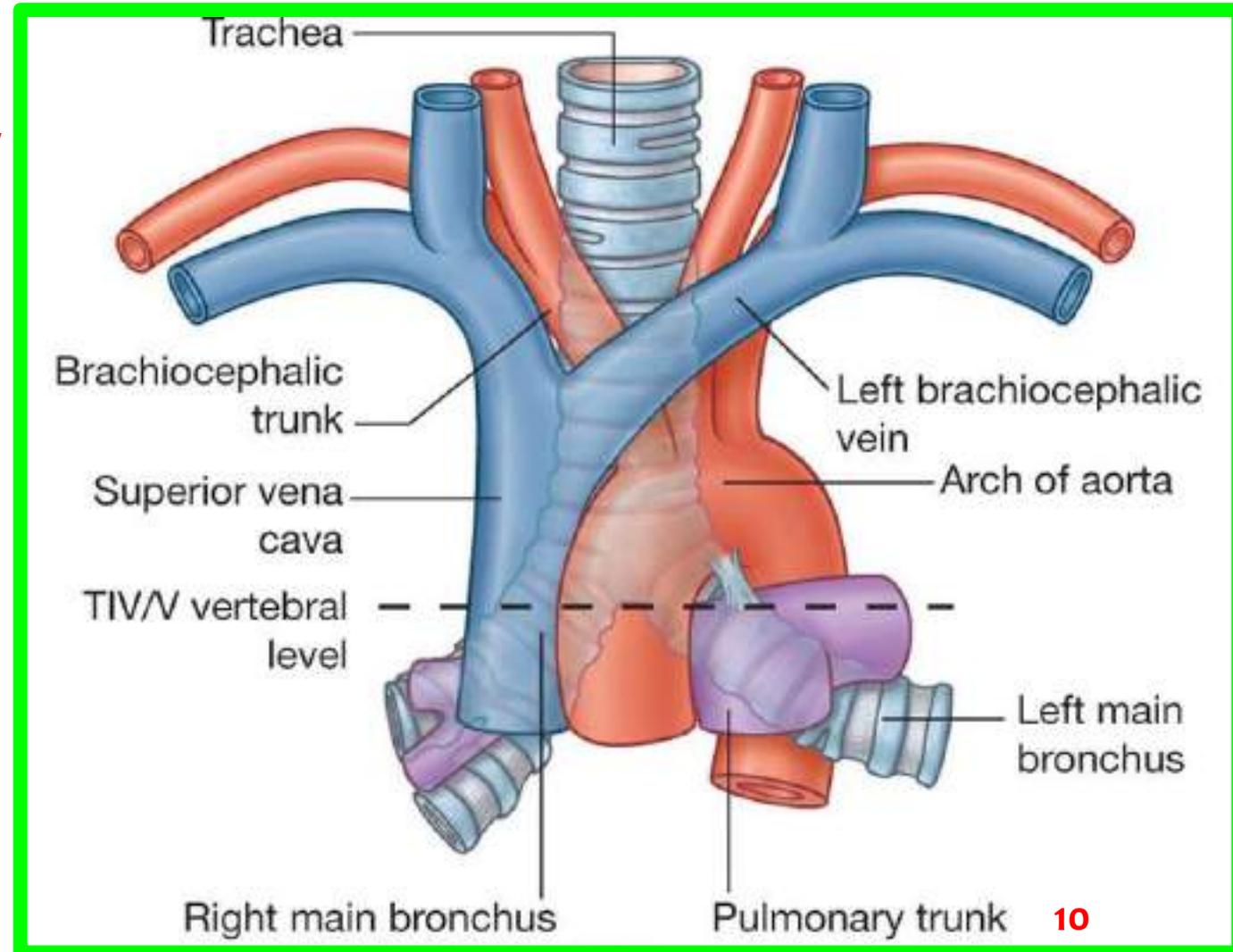
Arch of aorta

**** Relation to upper convex aspect:**

A. 3 arteries arising from it:

1. The brachiocephalic trunk
2. The left common carotid artery
3. The left subclavian artery

**B. The left brachiocephalic vein:
crossing from Lt. to Rt. Along the
upper border of aortic arch**



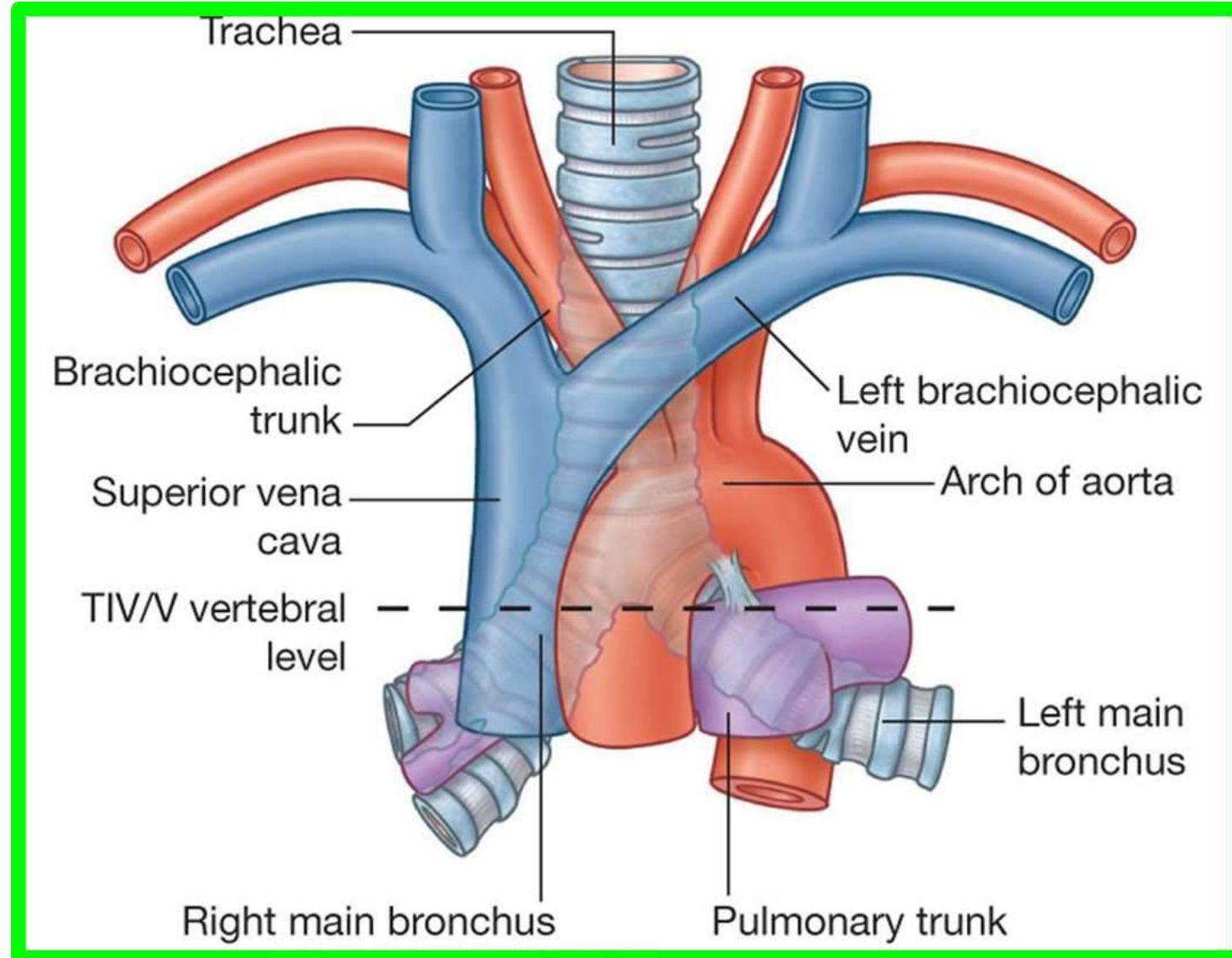
Arch of aorta

** Relation to concave border:

A. 3 Arteries:

1. Pulmonary trunk
2. Rt. Pulmonary artery
3. Lt. pulmonary artery + ligamentum arteriosus

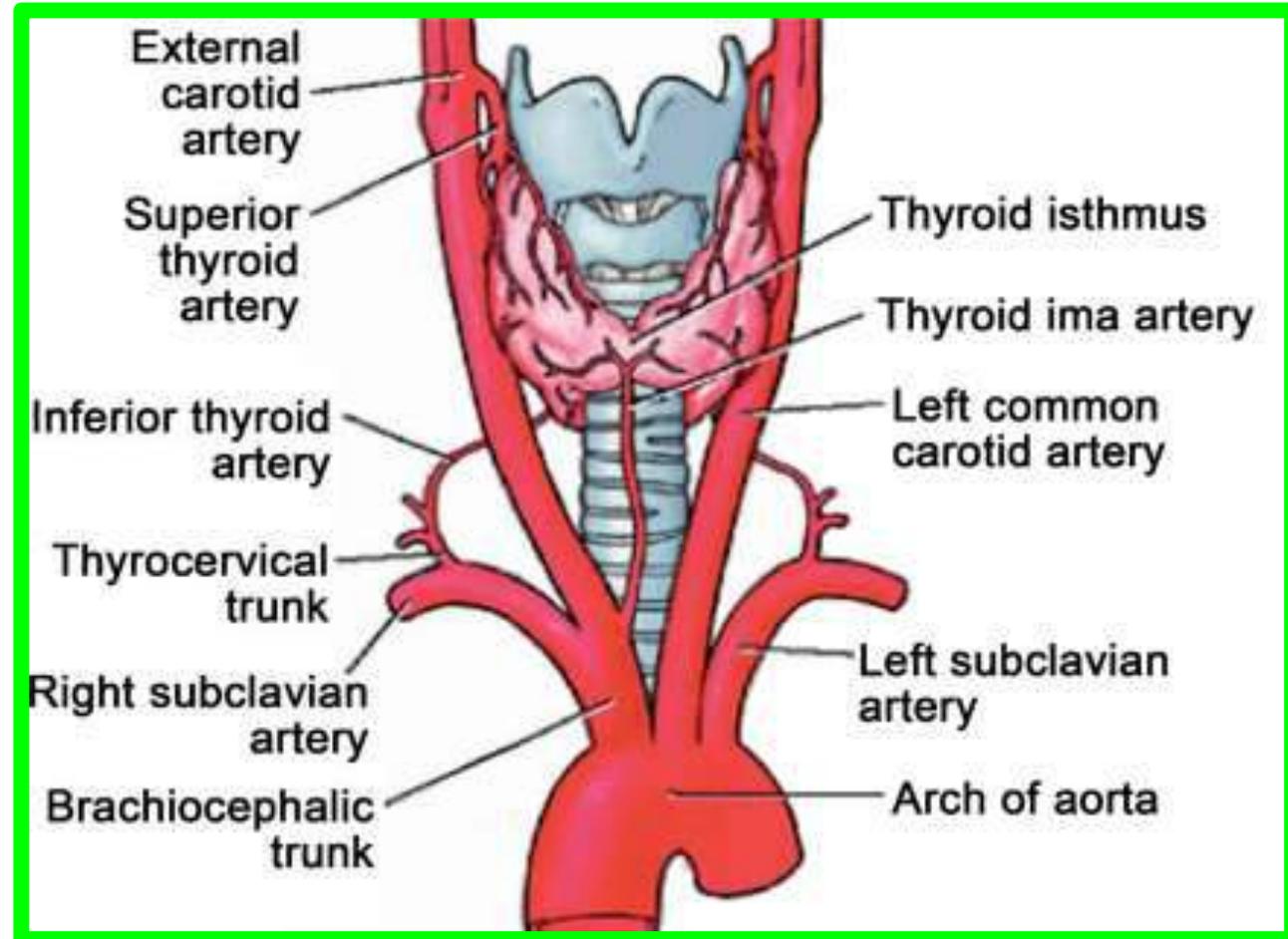
B. Lt. main bronchus



Arch of aorta

**Branches

1. The brachiocephalic trunk
2. The left common carotid artery
3. The left subclavian artery
4. **Thyroid ima artery: very small branch that ascend to supply the thyroid gland in the neck**

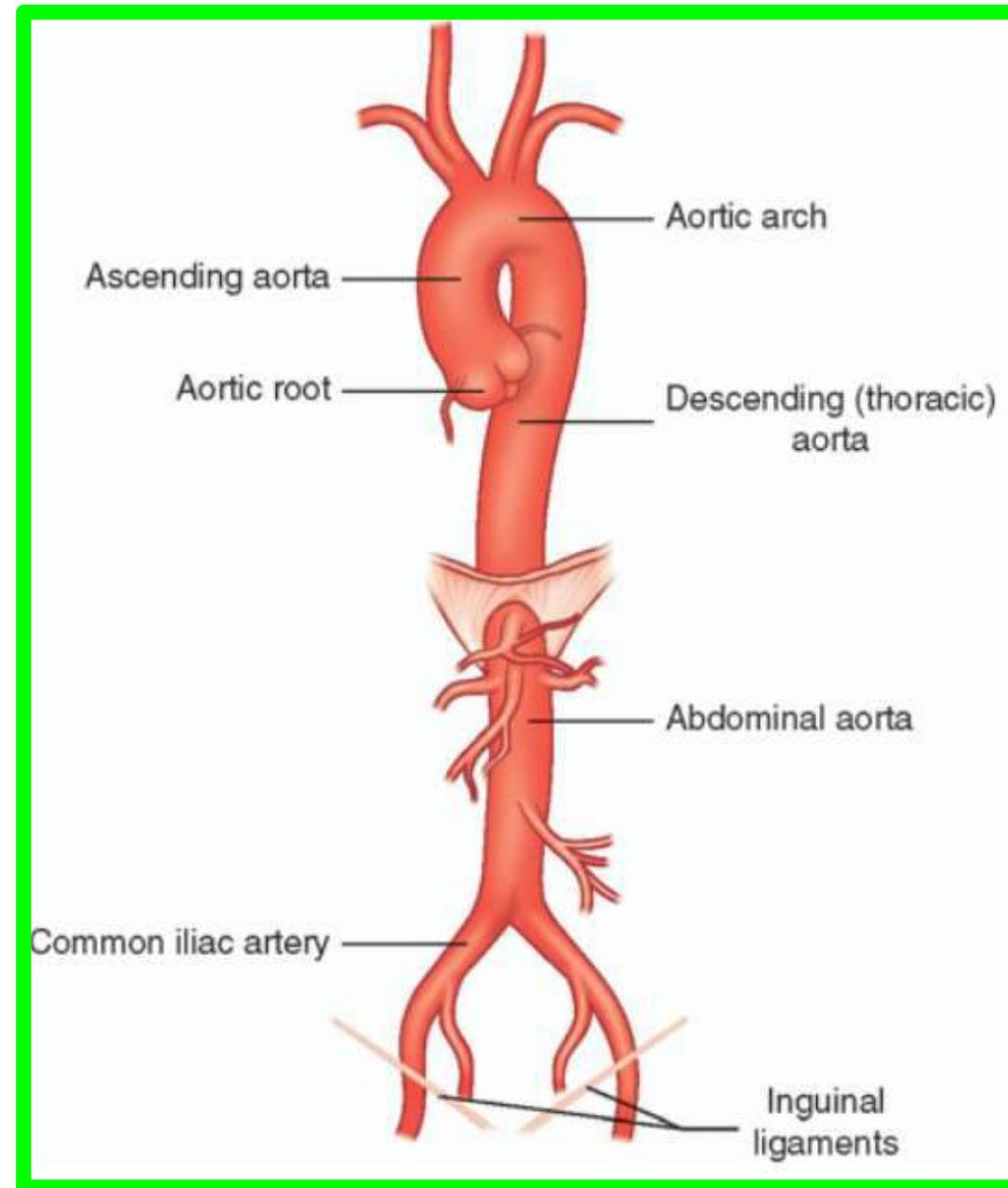


Descending Thoracic aorta

**** Site:** Posterior mediastinum

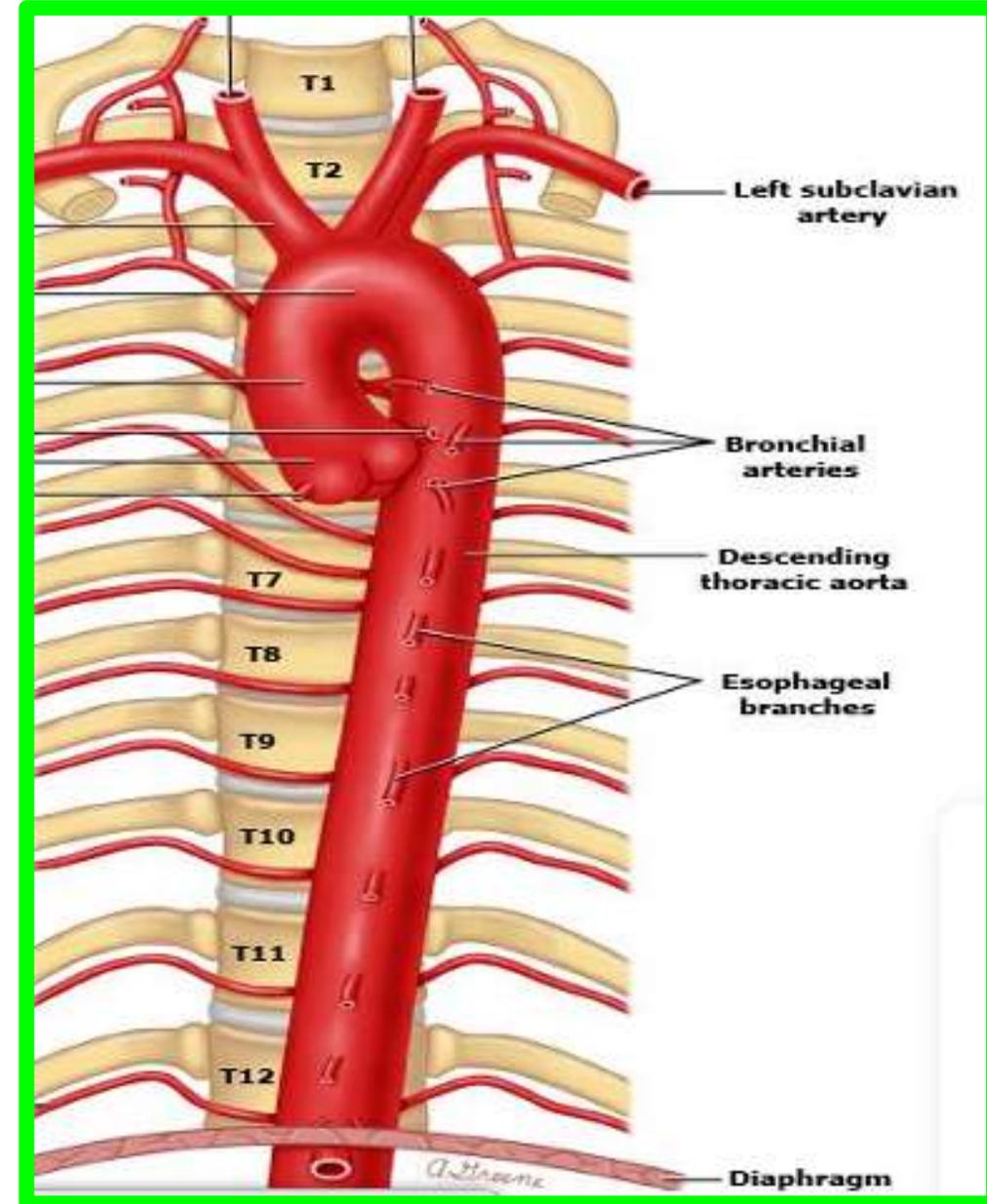
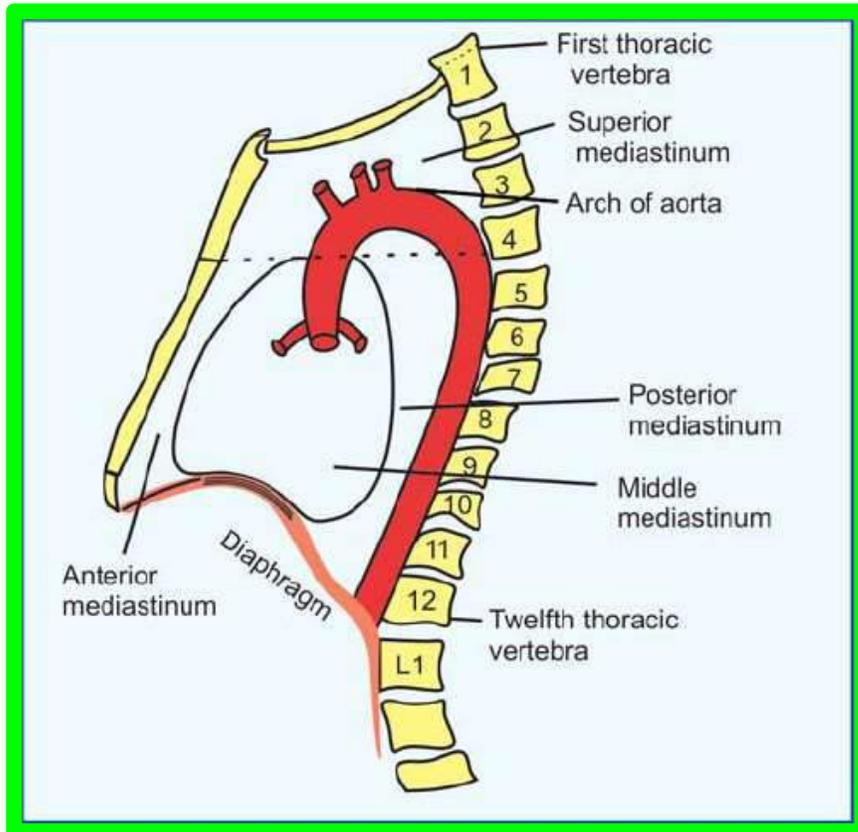
**** begins:** at the lower edge of **T4 vertebra**, as a continuation of the **arch of aorta**

****Ends:** at aortic opening of the diaphragm at lower border of **T12 vertebrae**, where it becoming **abdominal aorta**



Descending Thoracic aorta

****Course:** it descends vertically downwards in the post. Mediastinum lying at first to the Lt, side of bodies 5th, 6th, 7th then it lies in front of lower 5 thoracic vertebrae (T8-T12)



Descending Thoracic aorta

**Relation posteriorly:

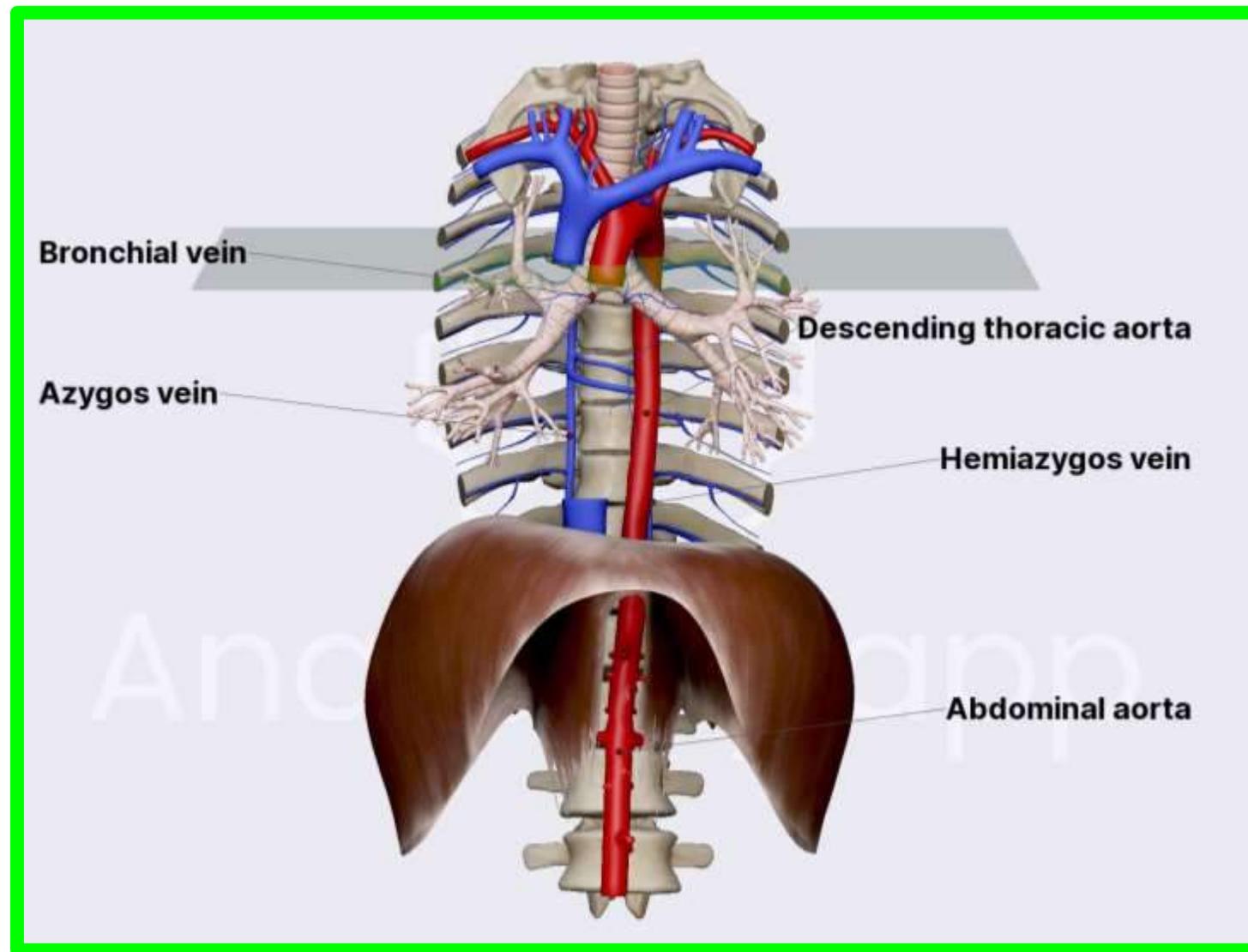
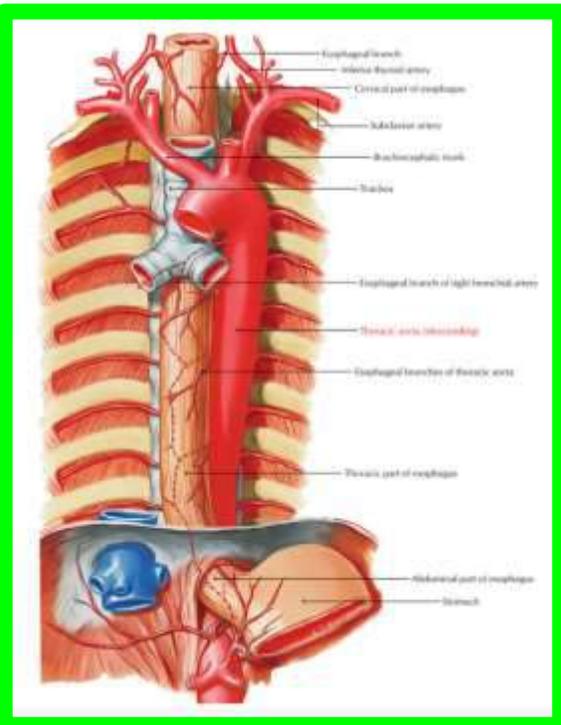
A. Vertebral column

B. Superior hemiazygose vein

{as it pass from Lt. to Rt. (T8)}

C. Inferior hemiazygose vein

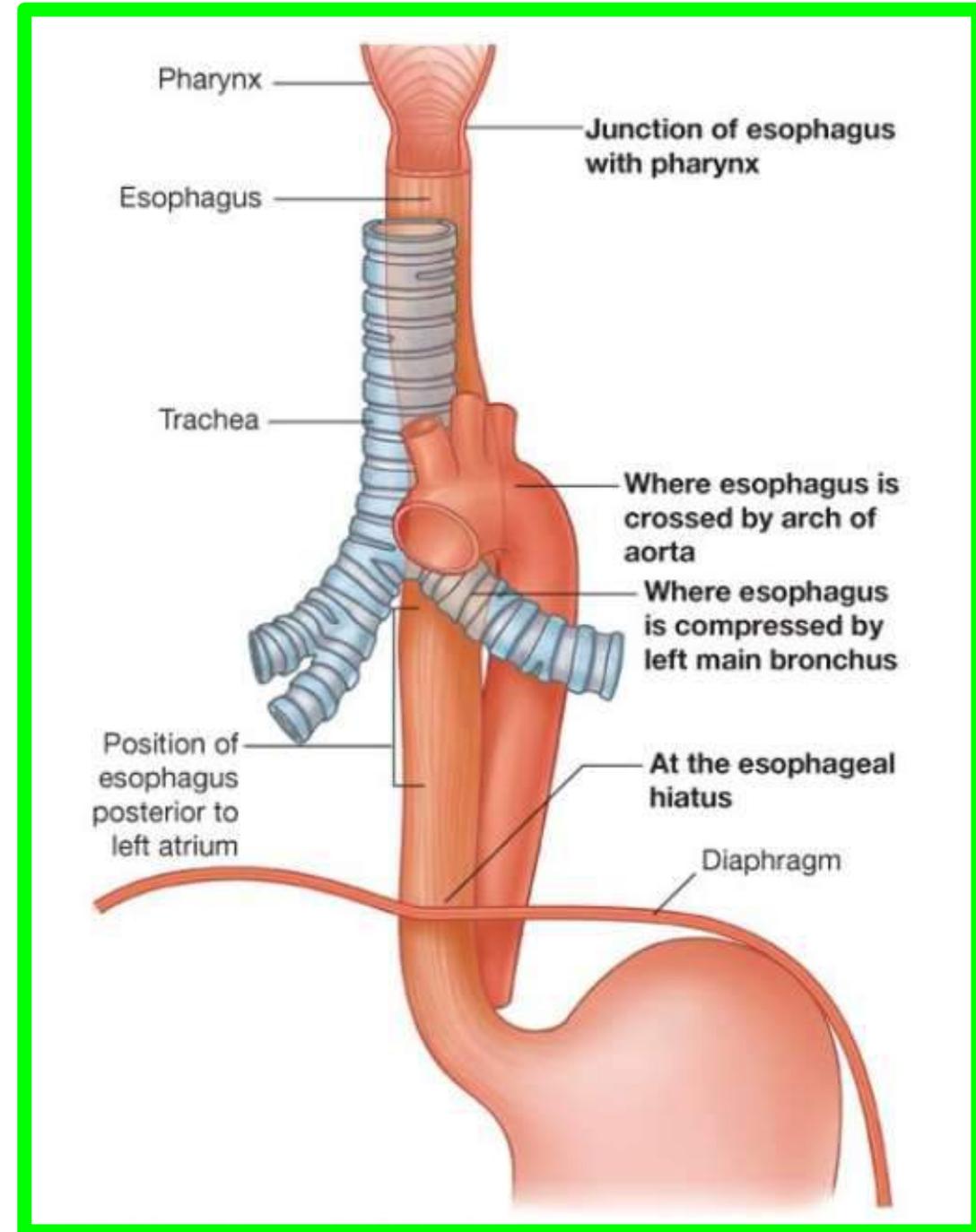
{as it pass from Lt. to Rt. (T9)}



Descending Thoracic aorta

****Relation anteriorly:** (from above downward)

- A. Lt bronchus & root of Lt. lung
- B. Oblique sinus of pericardium
- C. Esophagus opposite (T8,9,10)
- D. Diaphragm



Descending Thoracic aorta

**Left side relation:

- A. Lt lung & pleura
- B. Esophagus (below)

**Right side relation:

- A. Esophagus (above)
- B. Thoracic duct (below)
- C. Azygose vein (below)

DESCENDING AORTA

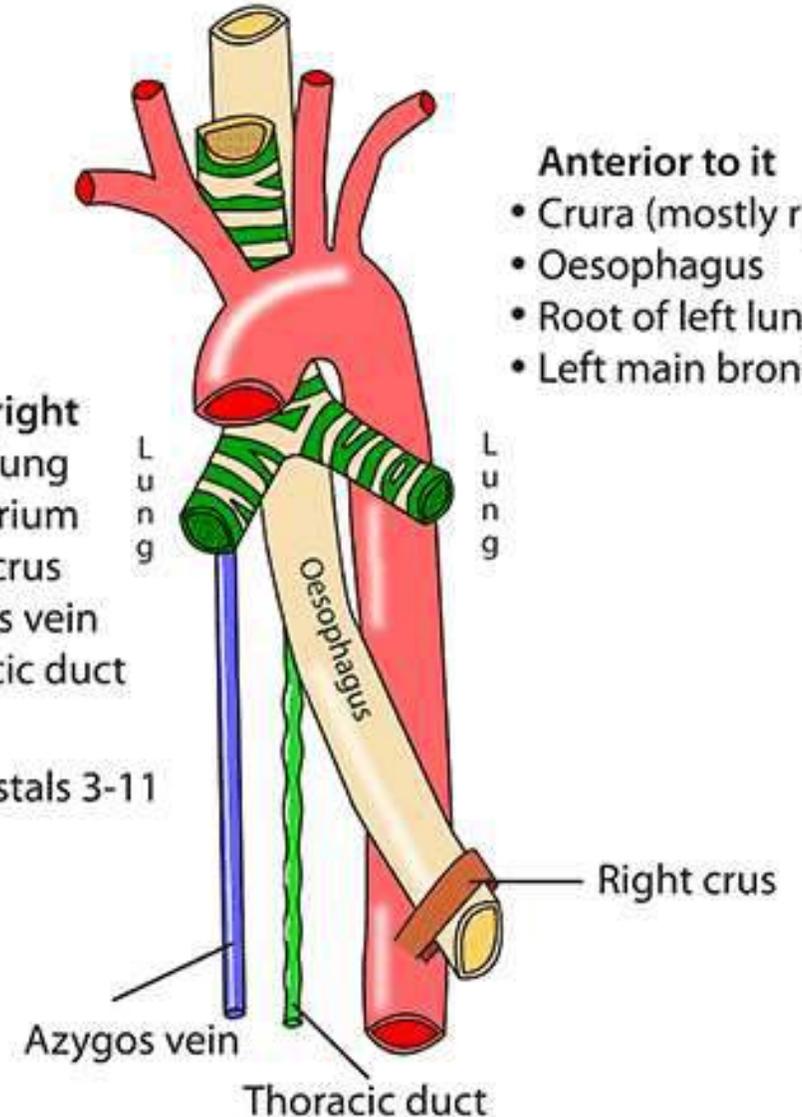
ANTERIOR VIEW

Runs from T4 to T12

- To its right
- Right lung
 - Left atrium
 - Right crus
 - Azygos vein
 - Thoracic duct

- Anterior to it
- Crura (mostly right)
 - Oesophagus
 - Root of left lung
 - Left main bronchus

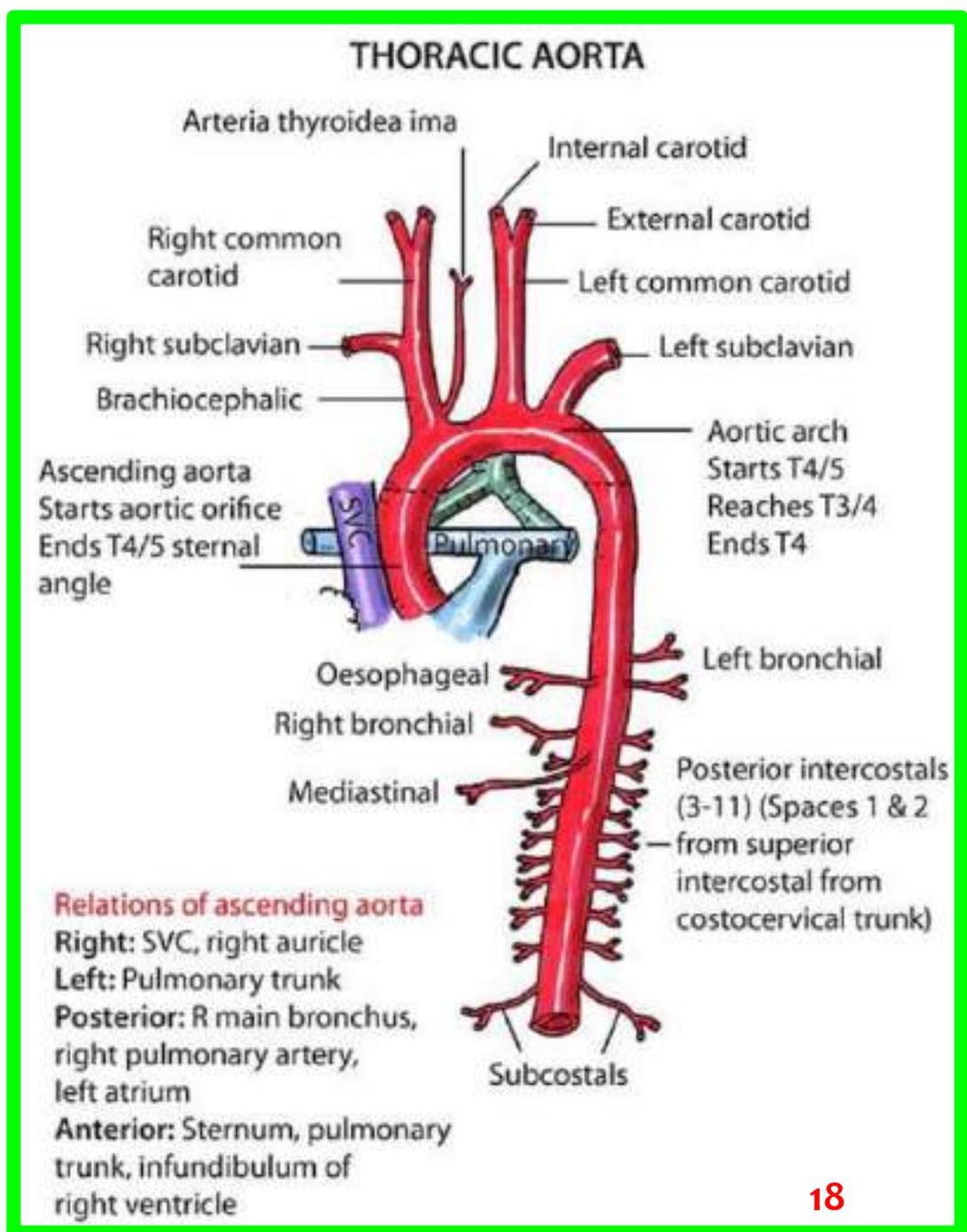
- It supplies
- Posterior intercostals 3-11
 - Subcostal (12)
 - Oesophageal
 - Bronchial
 - Phrenic
 - Mediastinal
 - Spinal



Descending Thoracic aorta

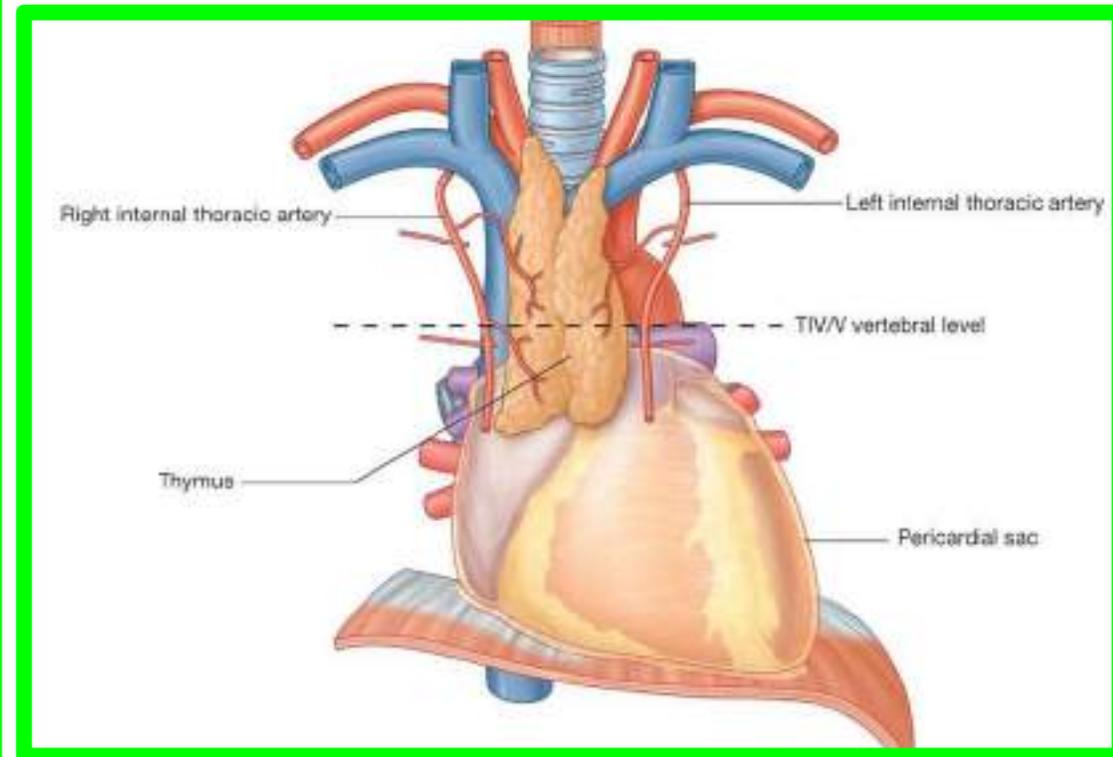
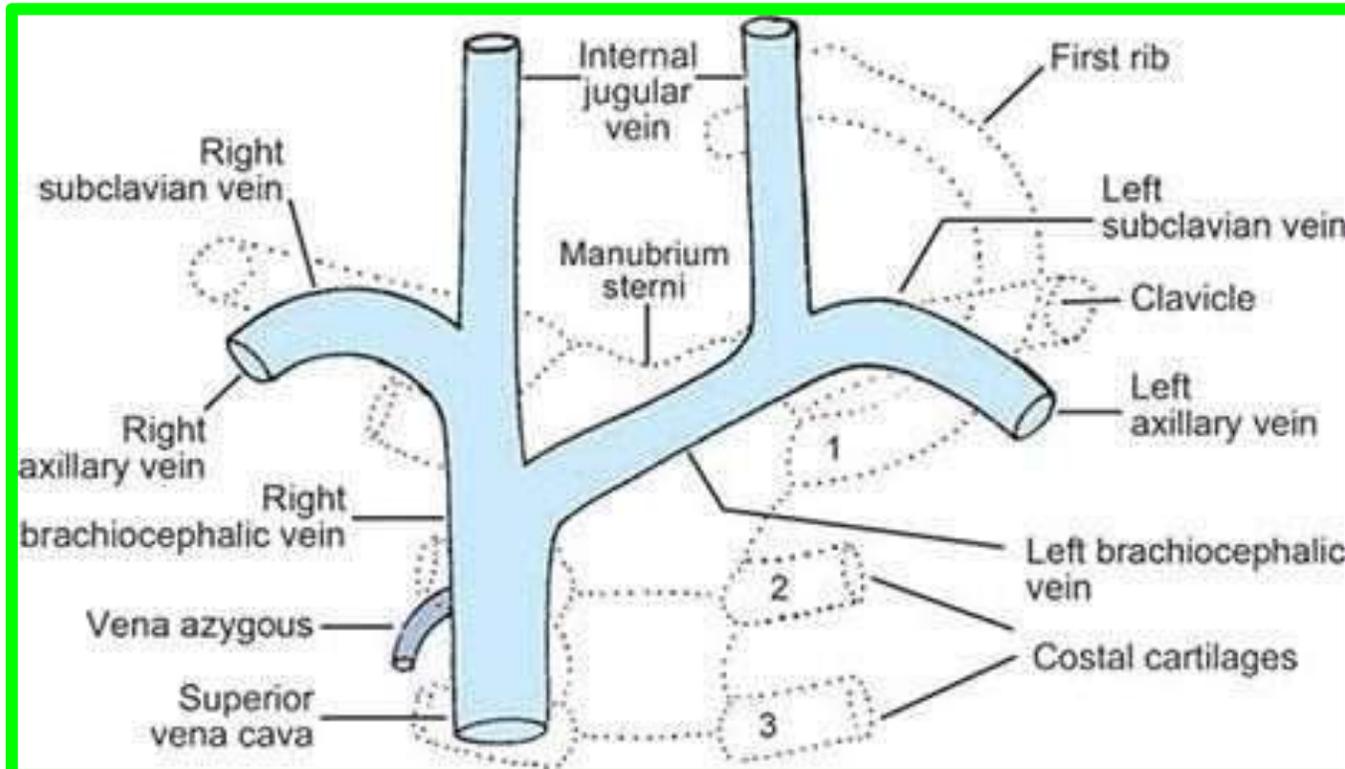
**Branches:

1. **Posterior intercostal arteries** (nine pairs from 3rd downward)
2. **Subcostal artery** (Rt. & Lt.)
3. **Bronchial branches** (2 Lt. & 1 Rt.)
4. **Esophageal branches** (4 or 5 vessels)
5. **Superior phrenic arteries**
6. **Mediastinal branches**
7. **Pericardial branches**



Right and left brachiocephalic veins

- ✓ They are located immediately posterior to the thymus & form on each side at the junction between the **internal jugular** and **subclavian veins**
- ✓ The **left brachiocephalic vein crosses the midline** and joins with the right brachiocephalic vein to form **the superior vena cava**

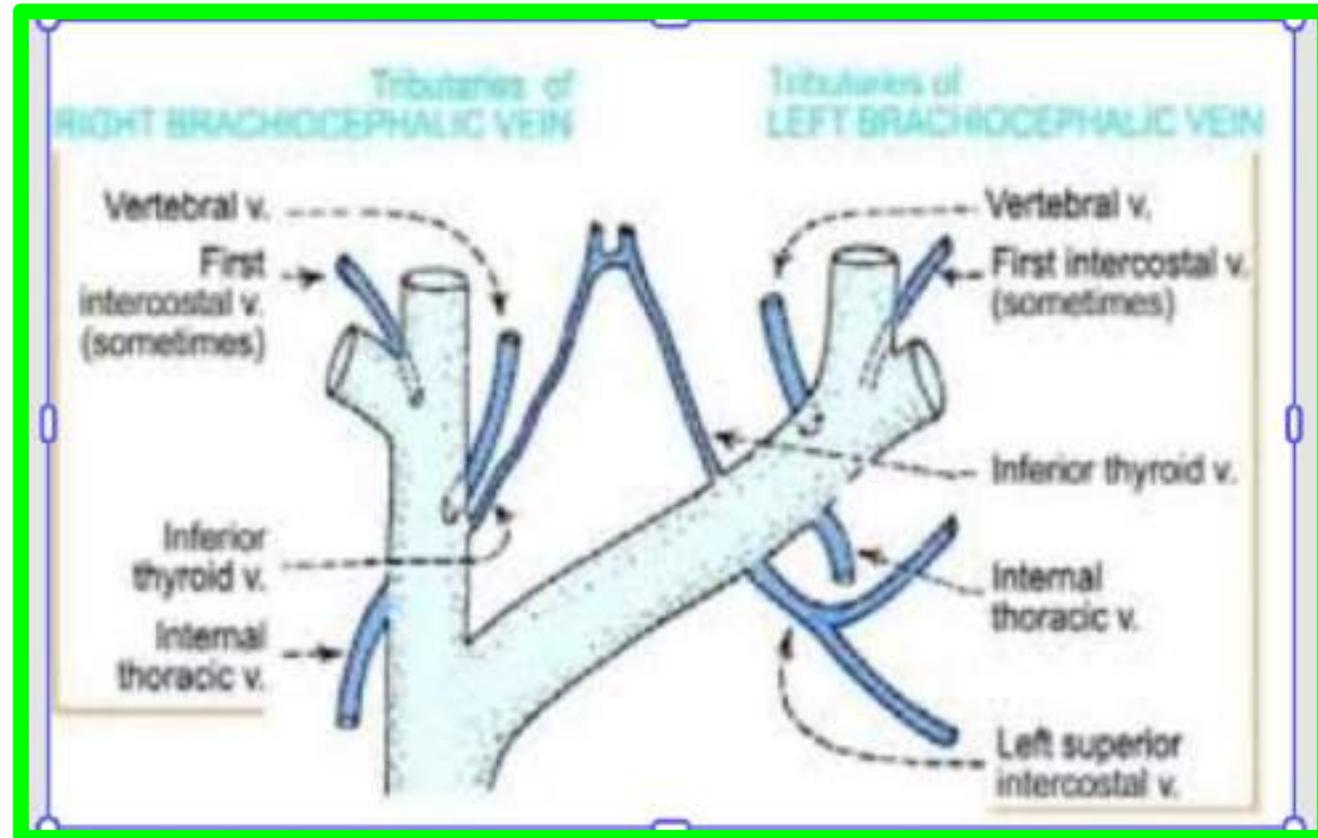


Right brachiocephalic veins

- ❖ Begins posterior to the medial end of the right clavicle
- ❖ passes vertically downward
- ❖ forming the superior vena cava when joined by its fellow

❖ Venous tributaries include:

1. vertebral vein
2. first posterior intercostal vein
3. internal thoracic vein.
4. The inferior thyroid and thymic veins may also drain into it.



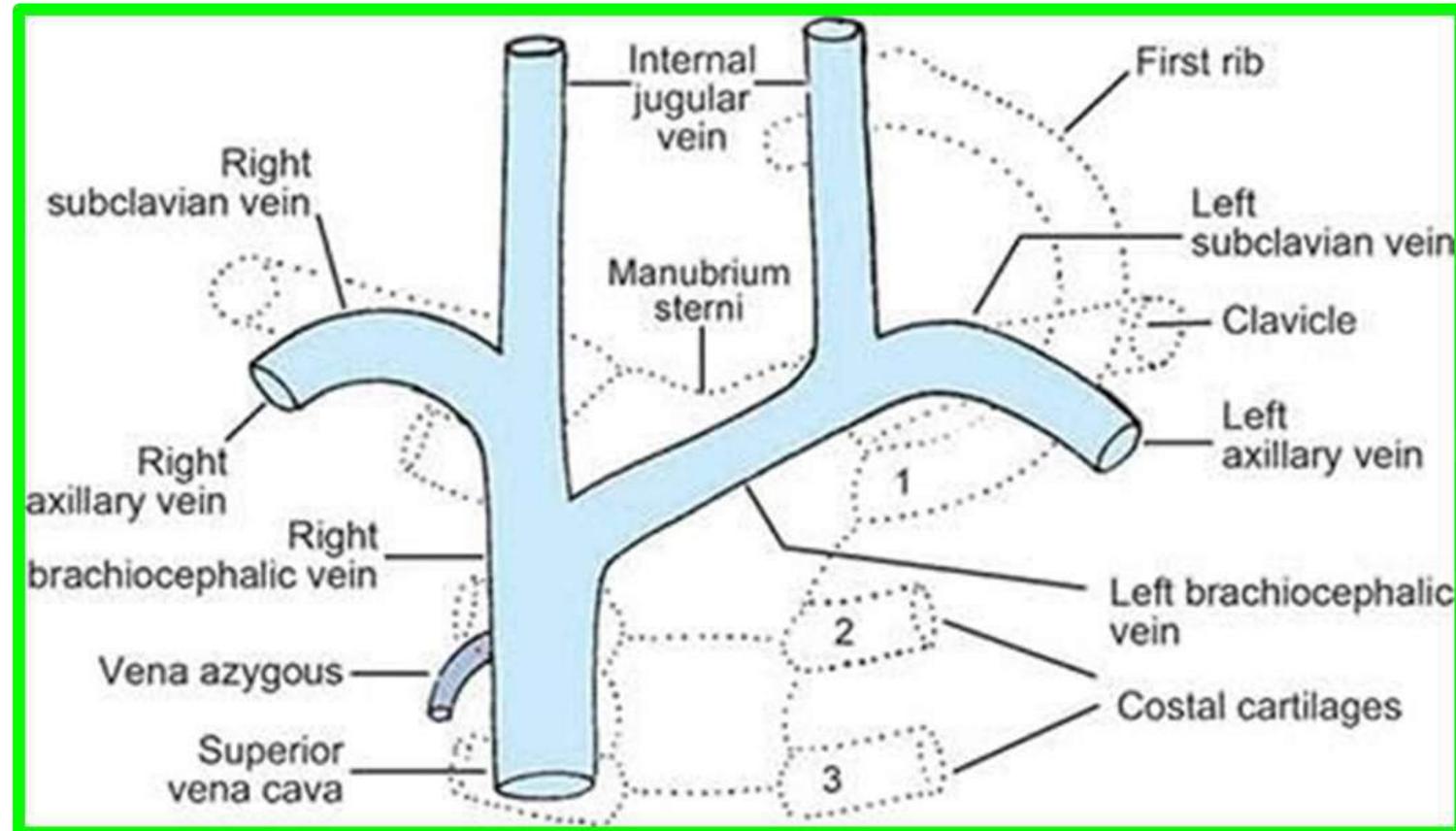
Left brachiocephalic veins

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- ❖ Begins posterior to the medial end of the left clavicle
- ❖ It crosses to the right joins with the right one to form the superior vena cava posterior to the **lower edge of the right first costal cartilage** close to the right sternal border.

❖ Venous tributaries include:

1. the vertebral
2. first posterior intercostal,
3. internal thoracic vein
4. left superior intercostal,
5. inferior thyroid, and
6. It may also receive **thymic and pericardial veins**



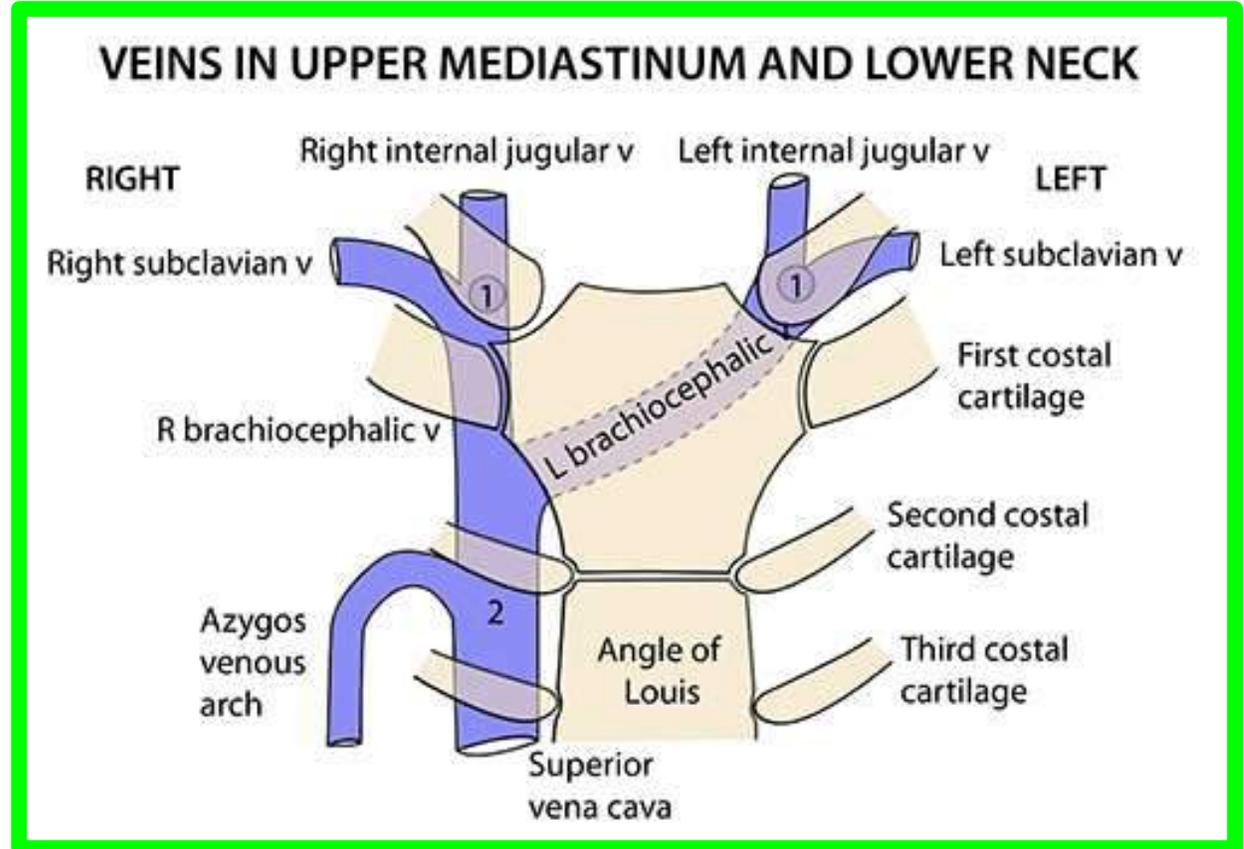
Superior vena cava

****Begins:** posterior to the lower edge of the **right first costal cartilage**

****terminates:** at the lower edge of the **right third costal cartilage**

****Length:** (5 - 7cm)

****Course:** Descend vertically downward behind the Rt. border of sternum



✓ Its **upper ½** in sup. mediastinum

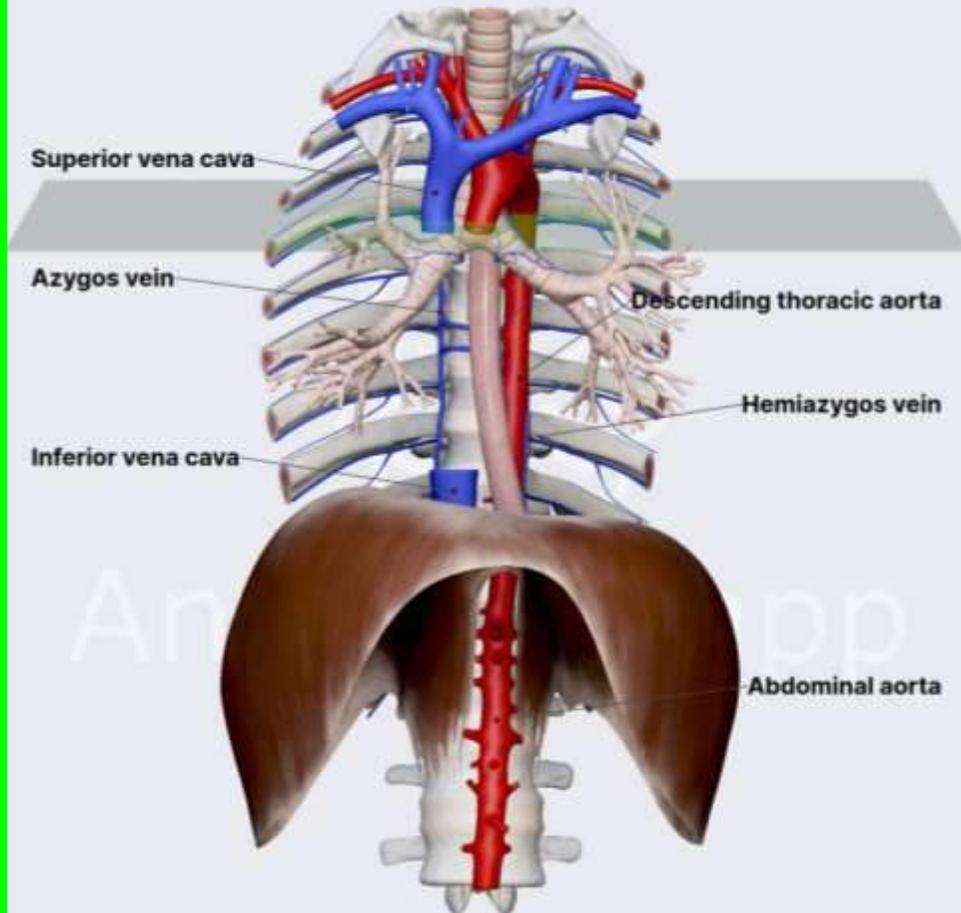
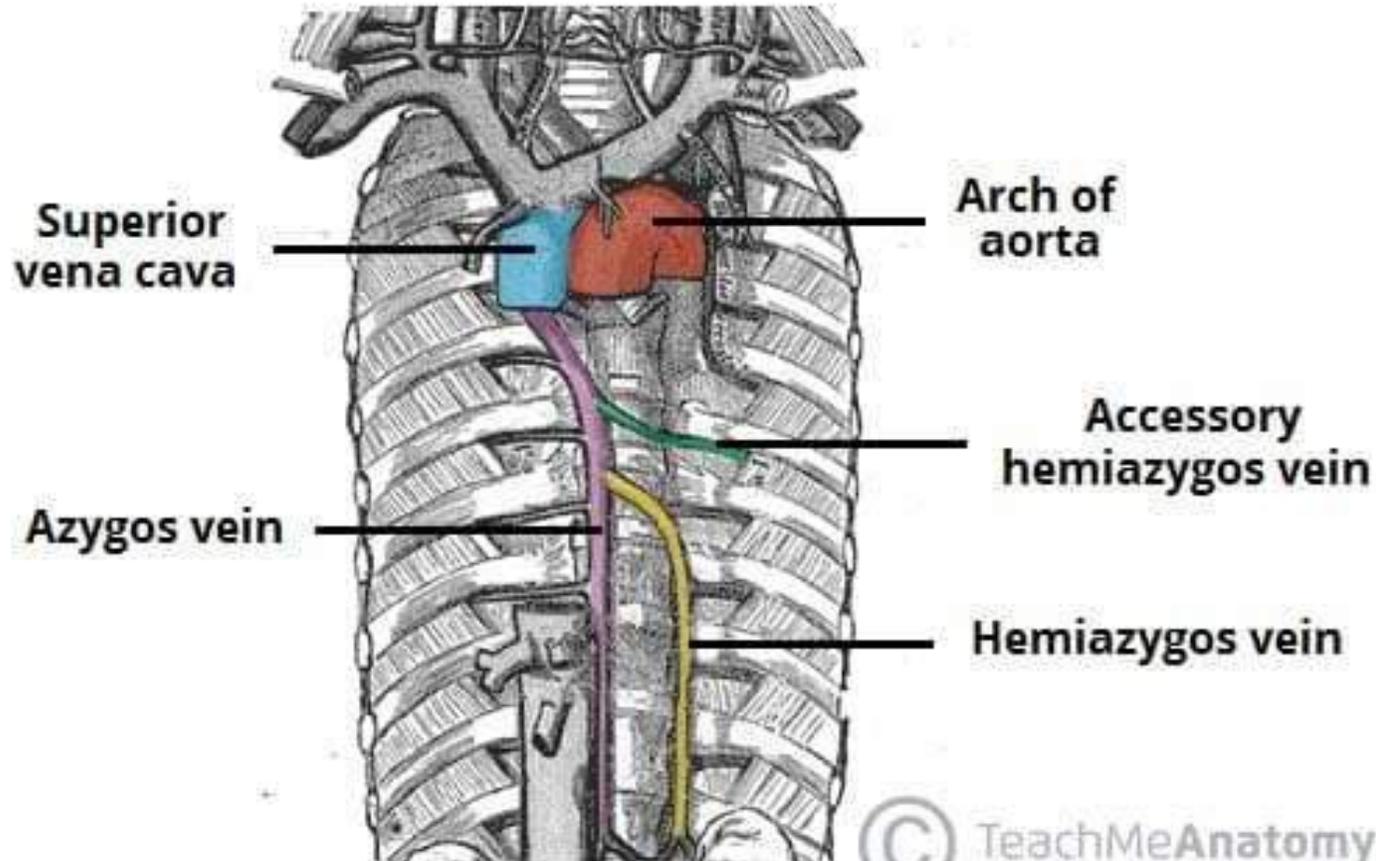
✓ Its **lower ½** lies in middle mediastinum within the pericardial sac

Superior vena cava

****Tributaries:** has only one; **arch of the azygos vein** which open into post.

Aspect of **S.V.C** at level of **2nd c.c** {level T4-T5}

✓ may also receive **pericardial** and **mediastinal veins**.



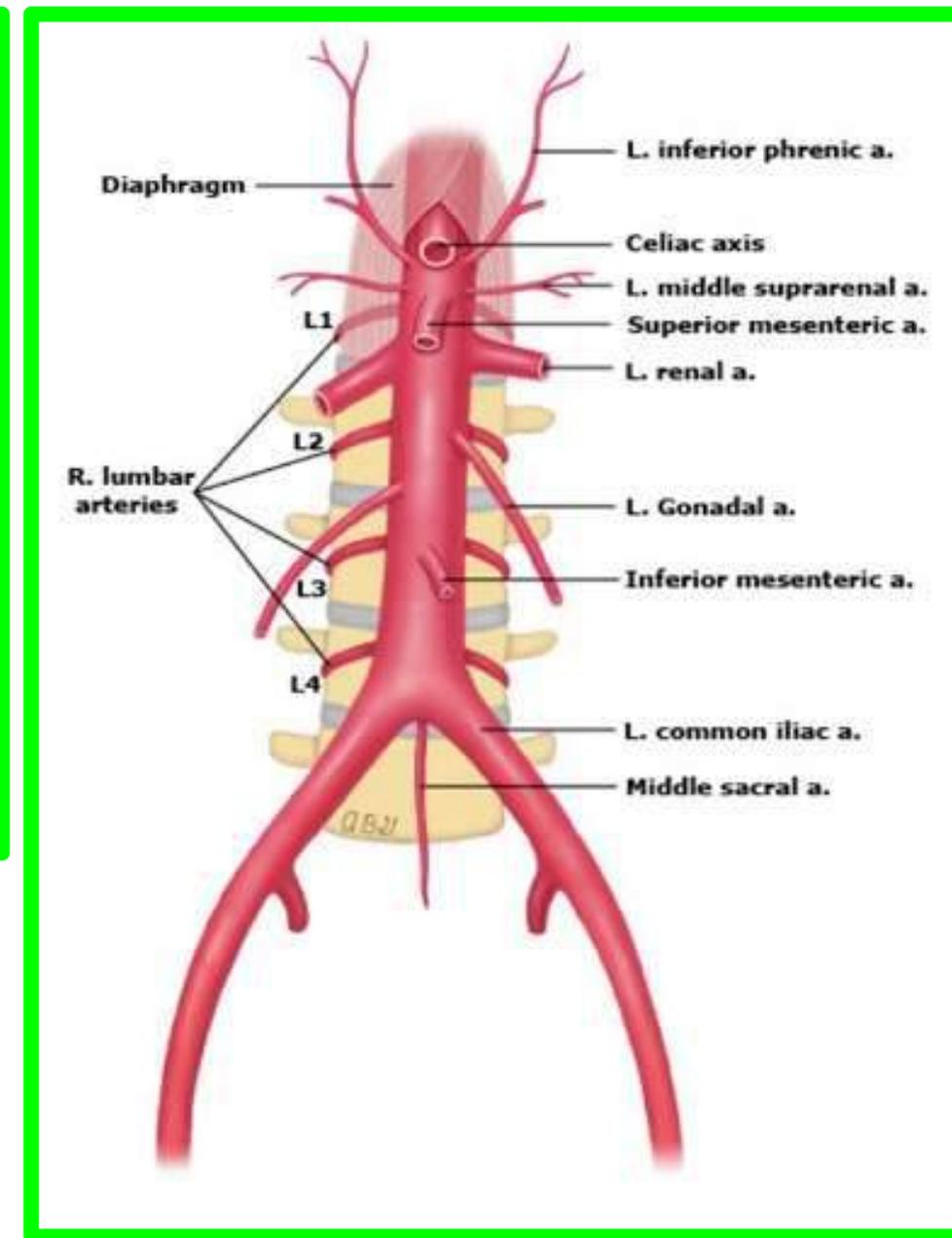
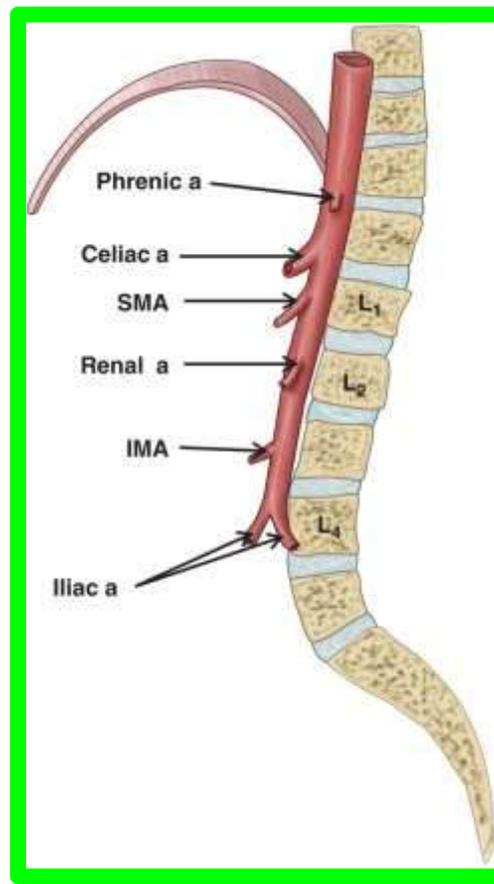
Abdominal Aorta

**** Beginning:** at the aortic opening of the diaphragm in front of the **12th thoracic vertebra**

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**** Course:** It descends downward in front of **upper 4 lumbar vertebra** behind peritoneum with incline to the Lt.

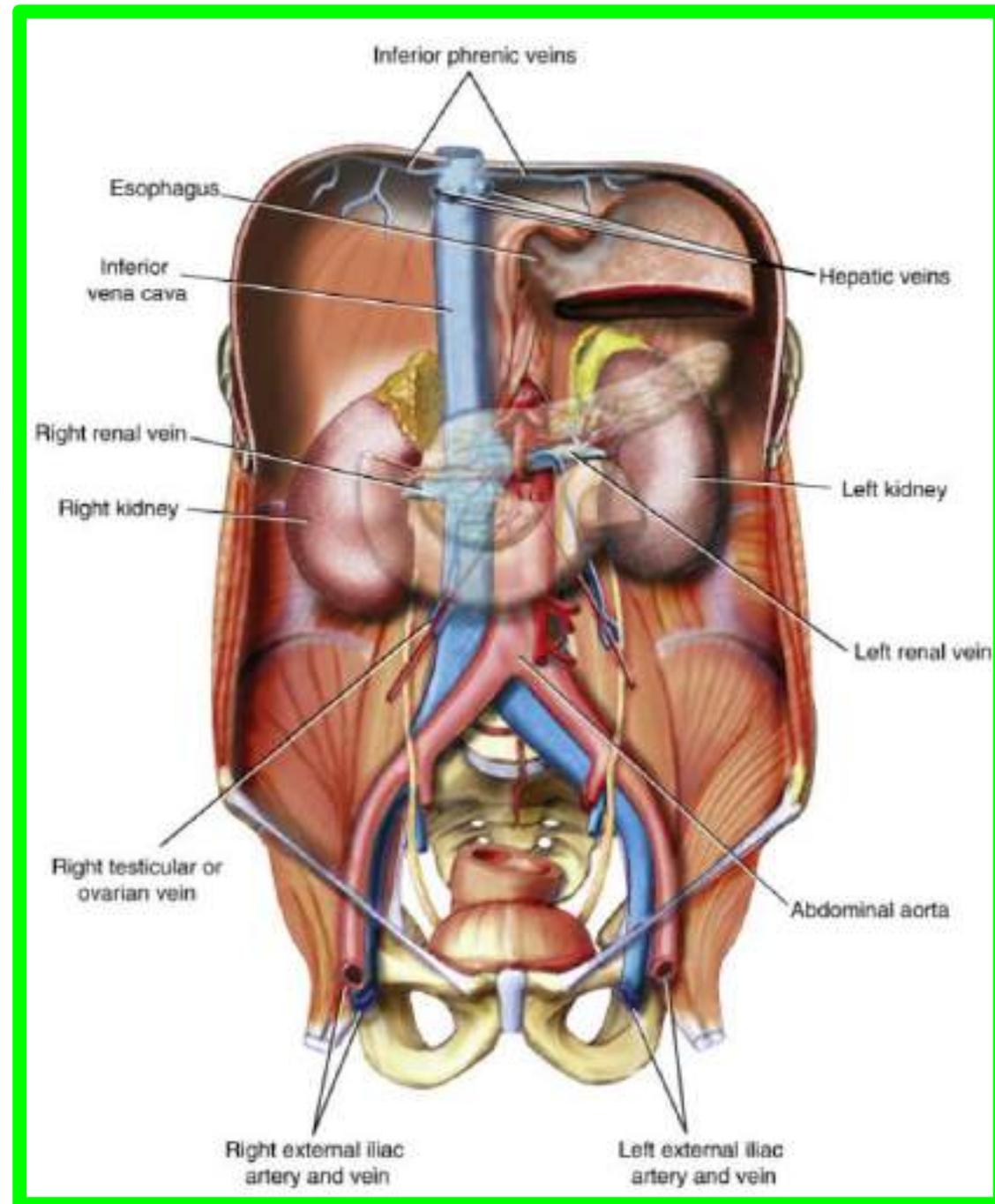
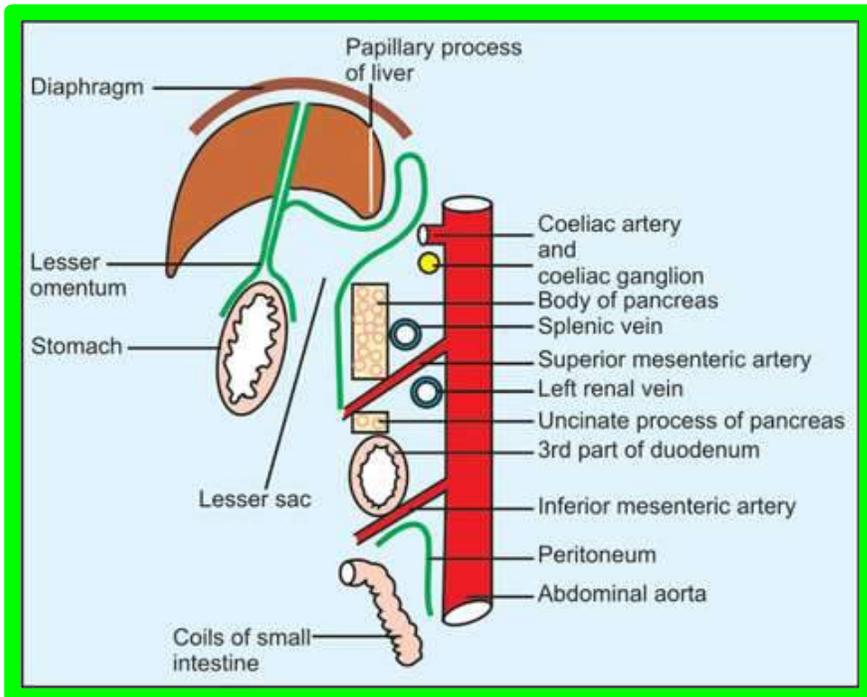
**** Termination:** at the **lower border of T4** by dividing into 2 common iliac arteries



Abdominal Aorta

****Anterior relation:** from above downward

1. Celiac trunk
2. Body of pancreas
3. 3rd part of the duodenum
4. Upper part of root of mesentery & its contents
5. Parietal peritoneum



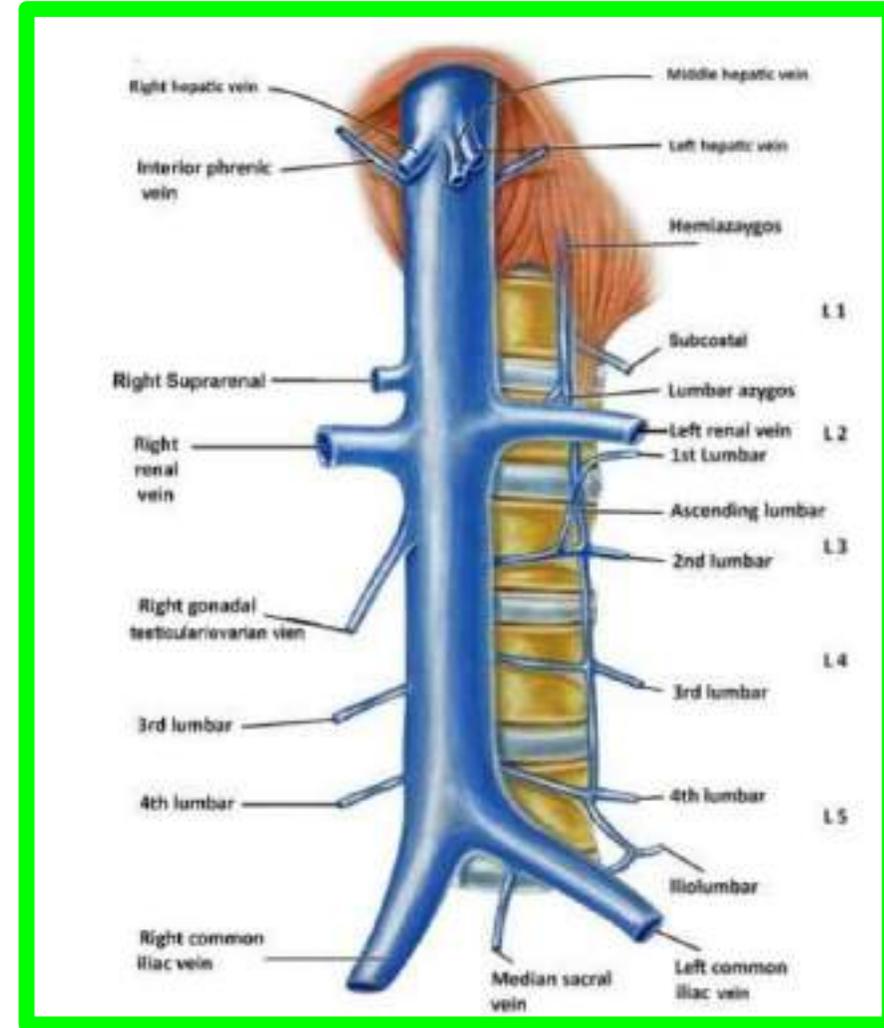
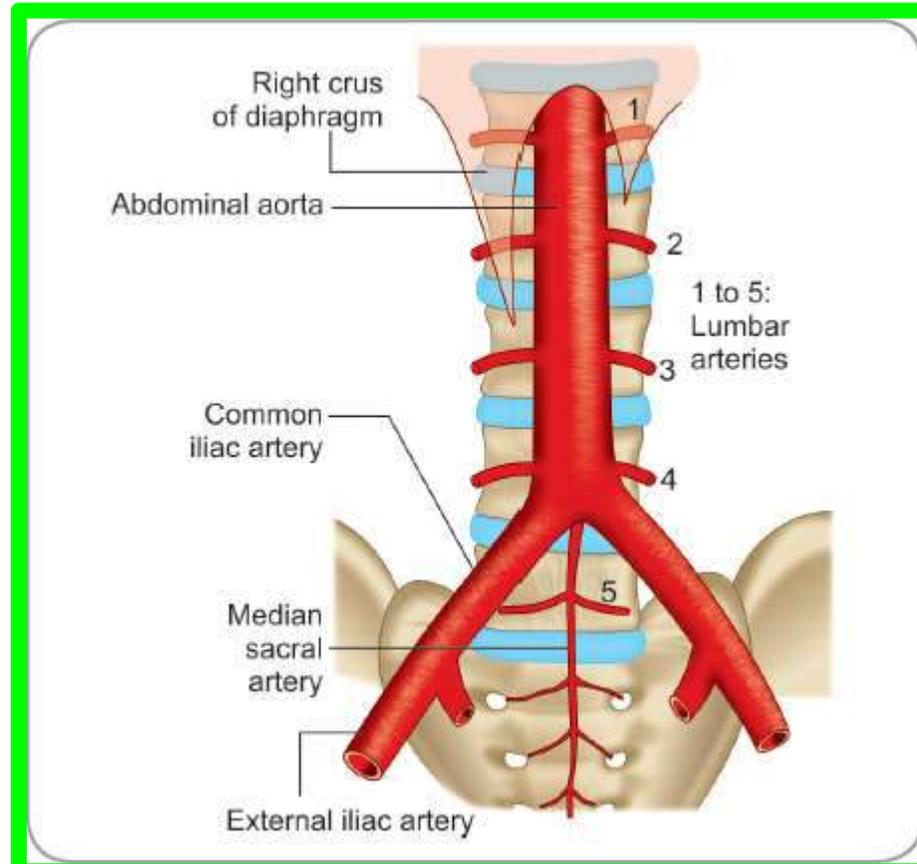
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Abdominal Aorta

** Posterior relations:

1. Bodies & IV discs of upper 4 Lumbar vertebrae
2. Anterior longitudinal ligament
3. 3rd & 4th Lt lumbar veins



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Abdominal Aorta

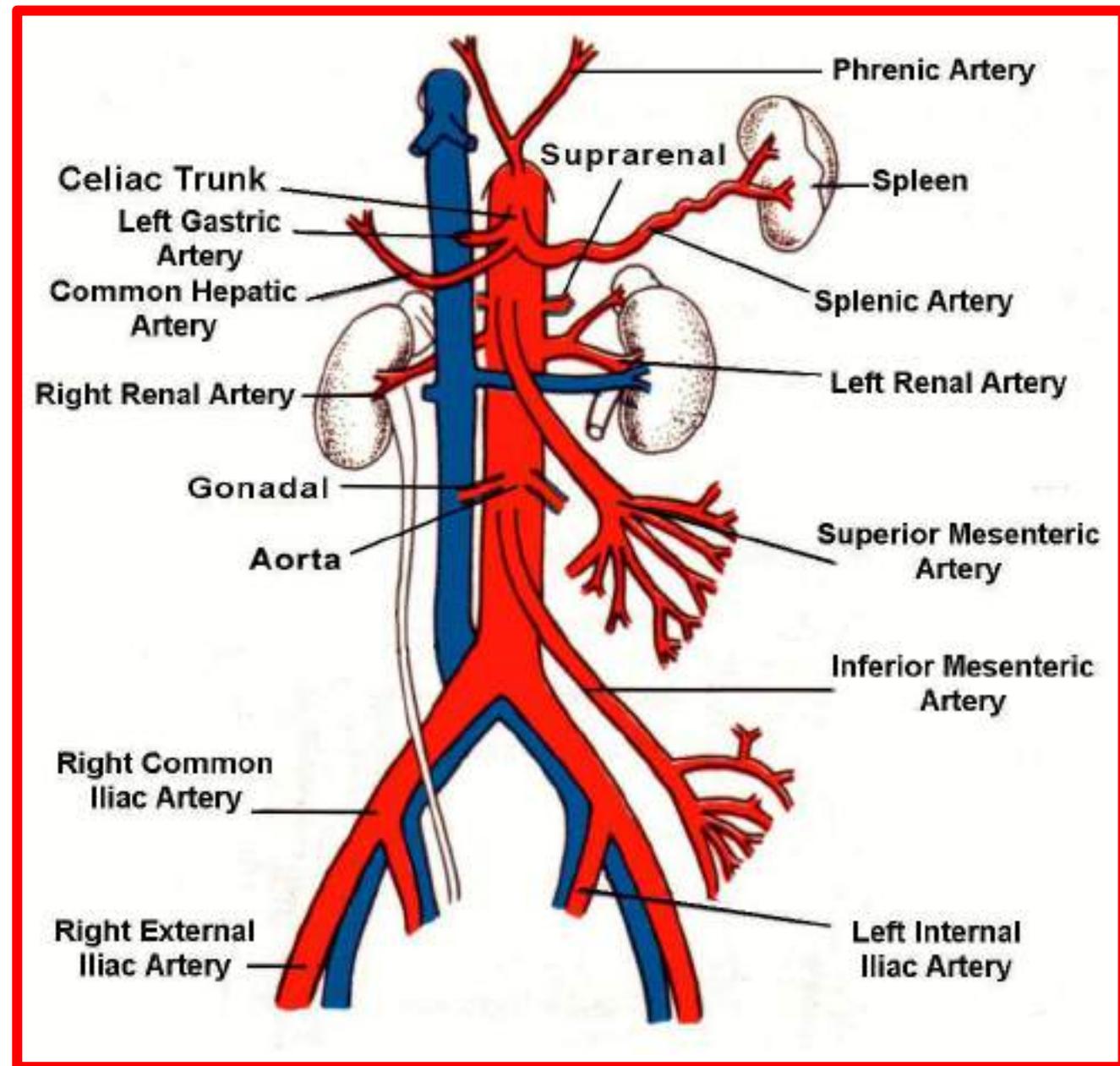
Branches

❖ Three anterior visceral branches:

- ✓ The celiac artery,
- ✓ Superior mesenteric artery
- ✓ Inferior mesenteric artery

❖ Three lateral visceral branches:

- ✓ The suprarenal artery,
- ✓ Renal artery (L2)
- ✓ Testicular or ovarian artery



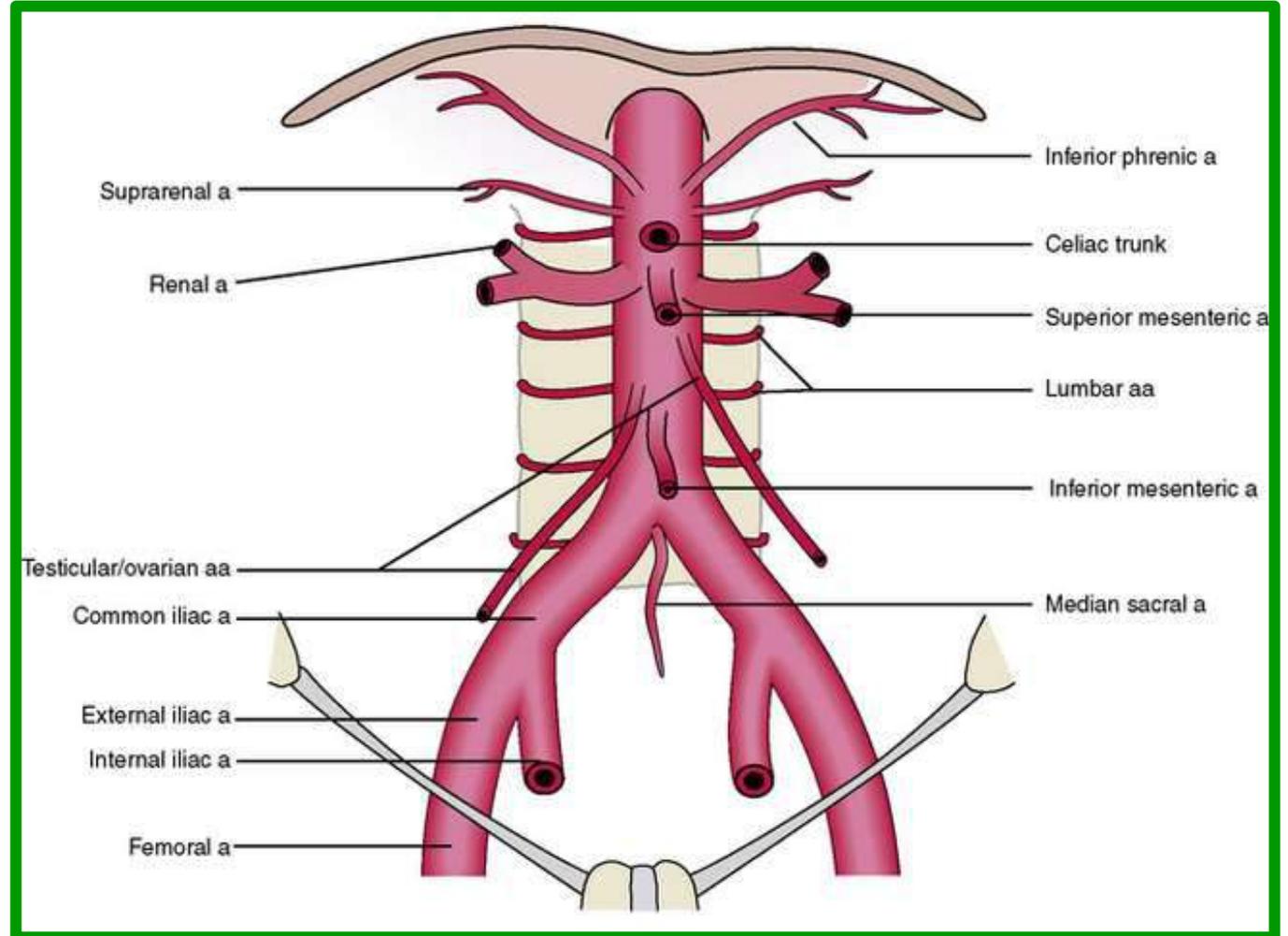
Abdominal Aorta

❖ Five lateral abdominal wall branches:

- ✓ The inferior phrenic artery
- ✓ Four lumbar arteries

❖ Three terminal branches:

- ✓ The two common iliac arteries
- ✓ The median sacral artery

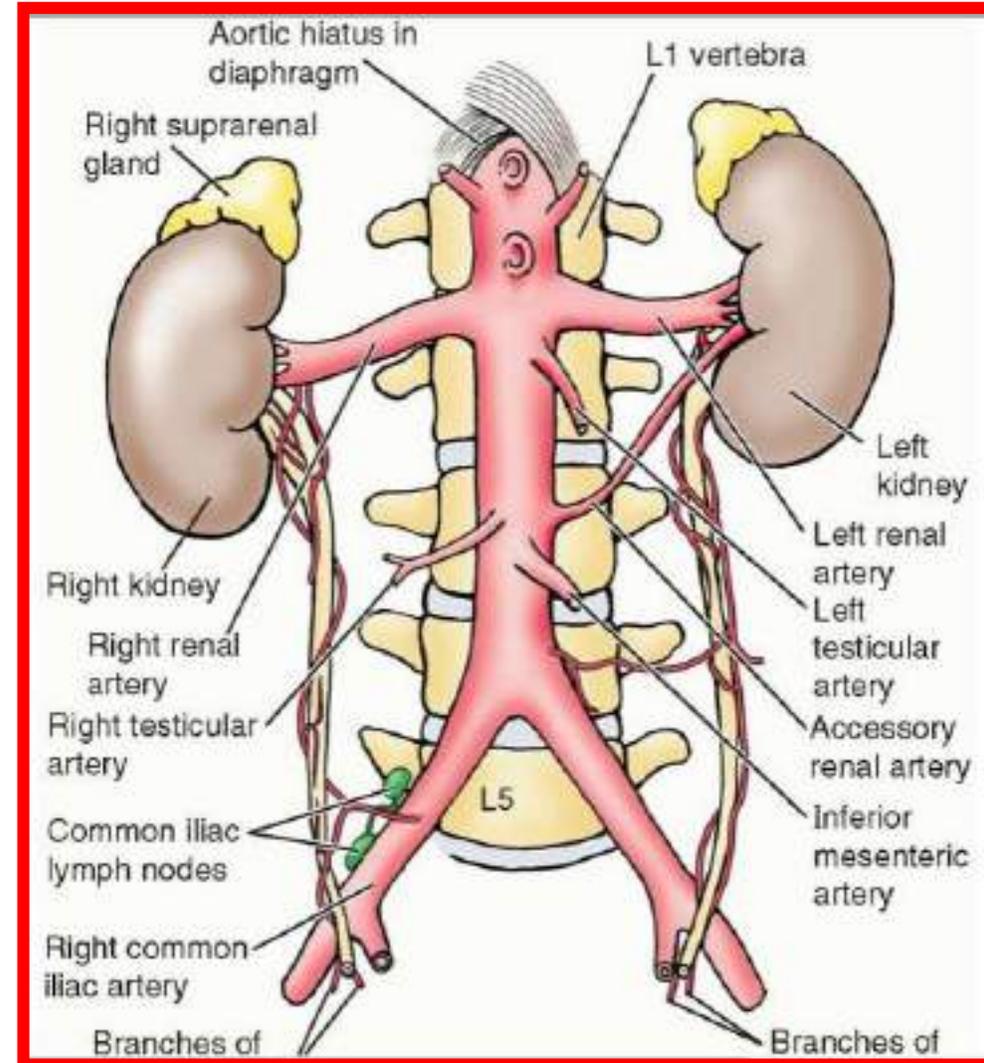


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Common Iliac Arteries

- ✓ They are the terminal branches of the aorta.
- ✓ They arise at the level of **the fourth lumbar vertebra** and run downward and laterally along the medial border of the psoas muscle
- ✓ Each artery ends in front of **the sacroiliac joint** by dividing into the **external** and **internal iliac** arteries.
- ✓ At the bifurcation, **the common iliac artery** on each side is crossed anteriorly by **the ureter**.

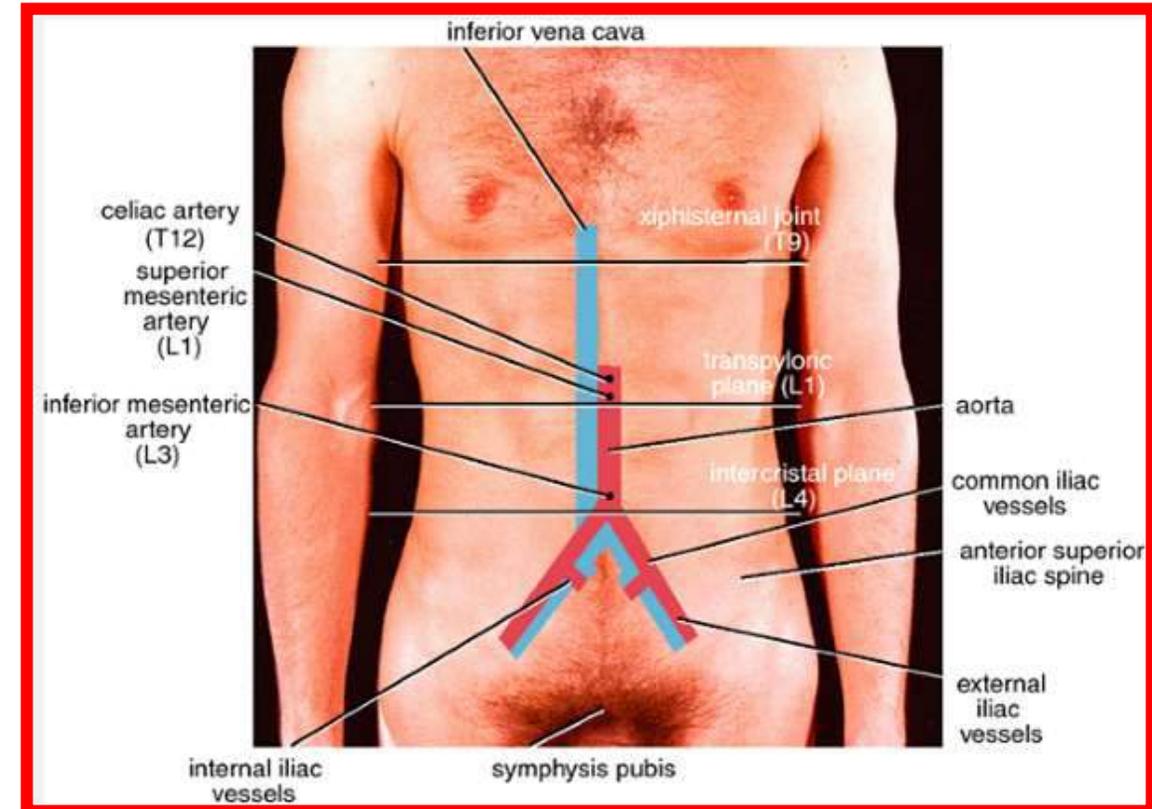


Inferior Vena Cava

**** Beginning:** in front of the **L5 vertebra** slightly to Rt. of median plane by the union of the **2 common iliac veins** behind the **right common iliac artery**

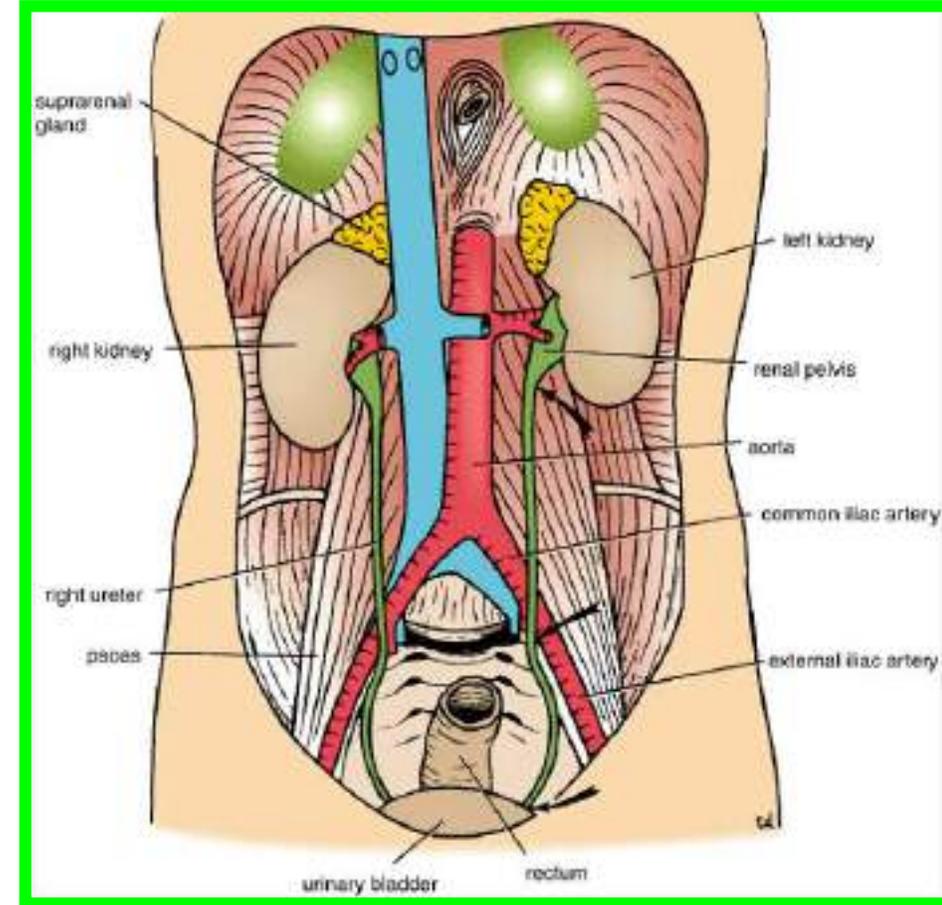
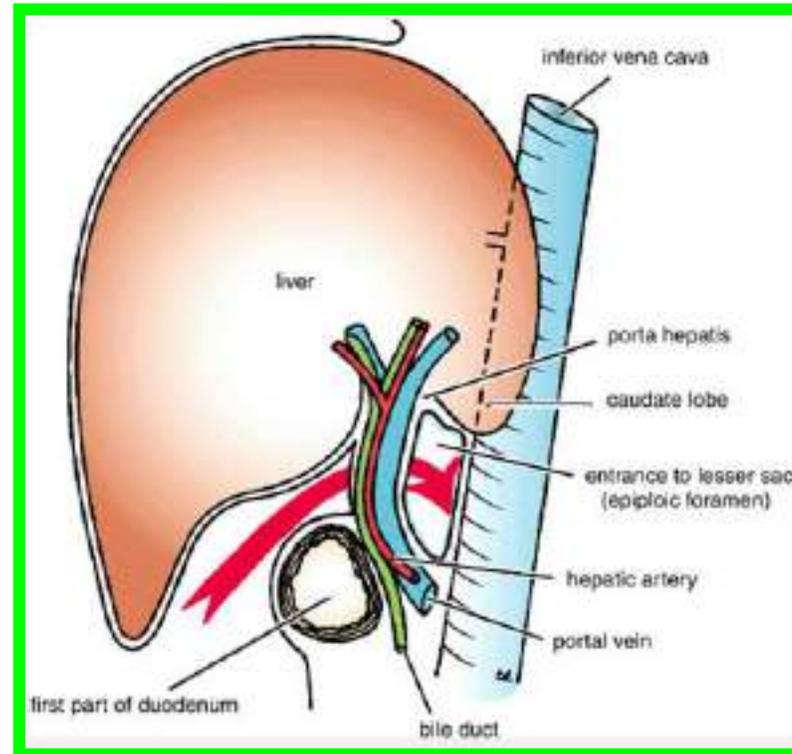
**** Course:** It ascends in front of lumbar vertebra on the Rt. side of the aorta, pierces **the central tendon of the diaphragm** at the level of **T8 vertebra**, and drains into the right atrium of the heart

**** Termination:** Rt. Atrium **2.5 cm** above the diaphragm opposite **5th c.c**



Inferior Vena Cava

- ✓ The right sympathetic trunk lies behind its right margin
- ✓ The right ureter lies close to its right border.
- ✓ The entrance into the lesser sac separates the inferior vena cava from the portal vein



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Inferior Vena Cava

Tributaries:

❖ **Two anterior visceral tributaries:**

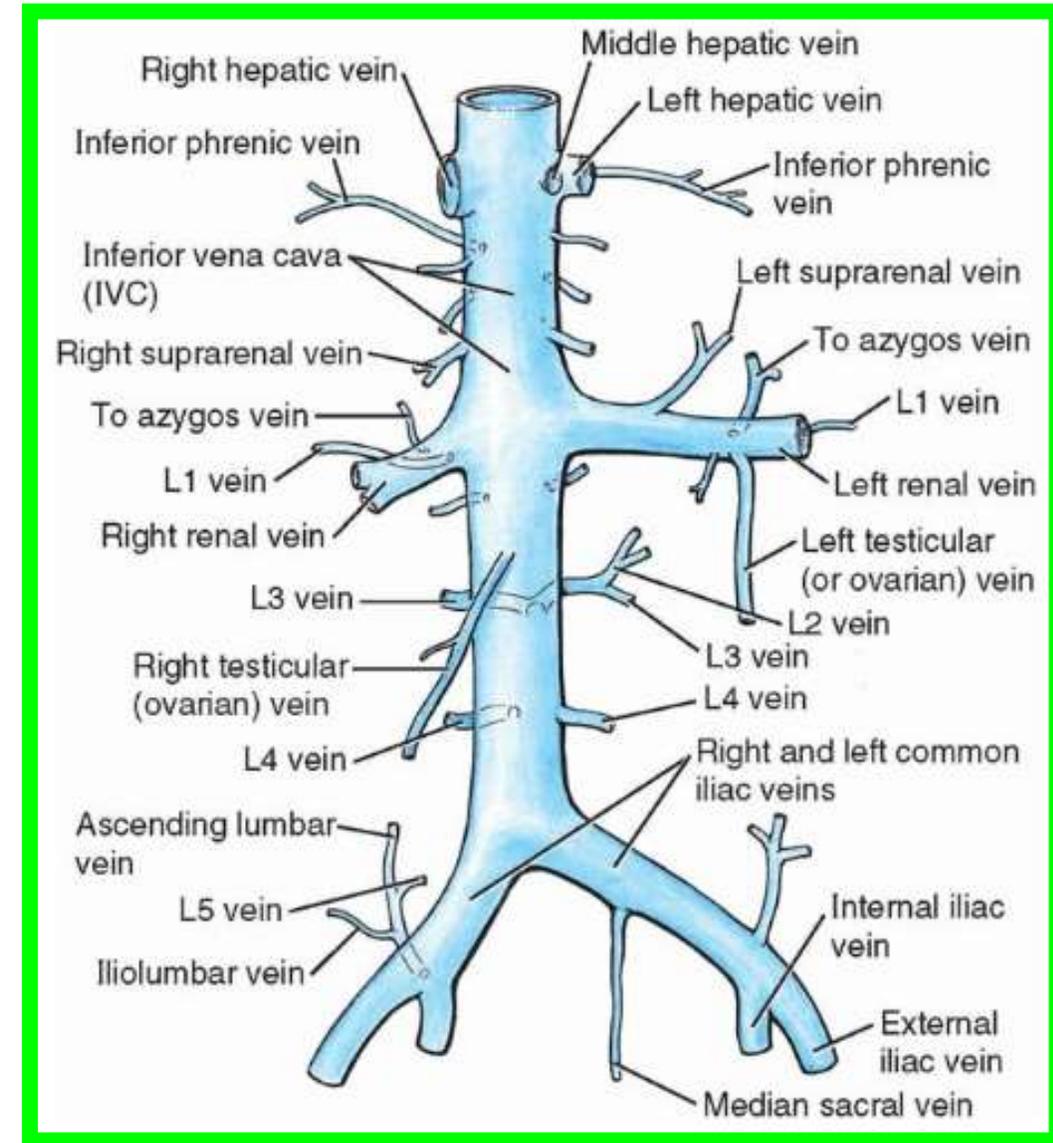
The hepatic veins

❖ **Three lateral visceral tributaries:**

✓ **The right suprarenal vein (the left vein drains into the left renal vein)**

✓ **Rt. & Lt. Renal veins**

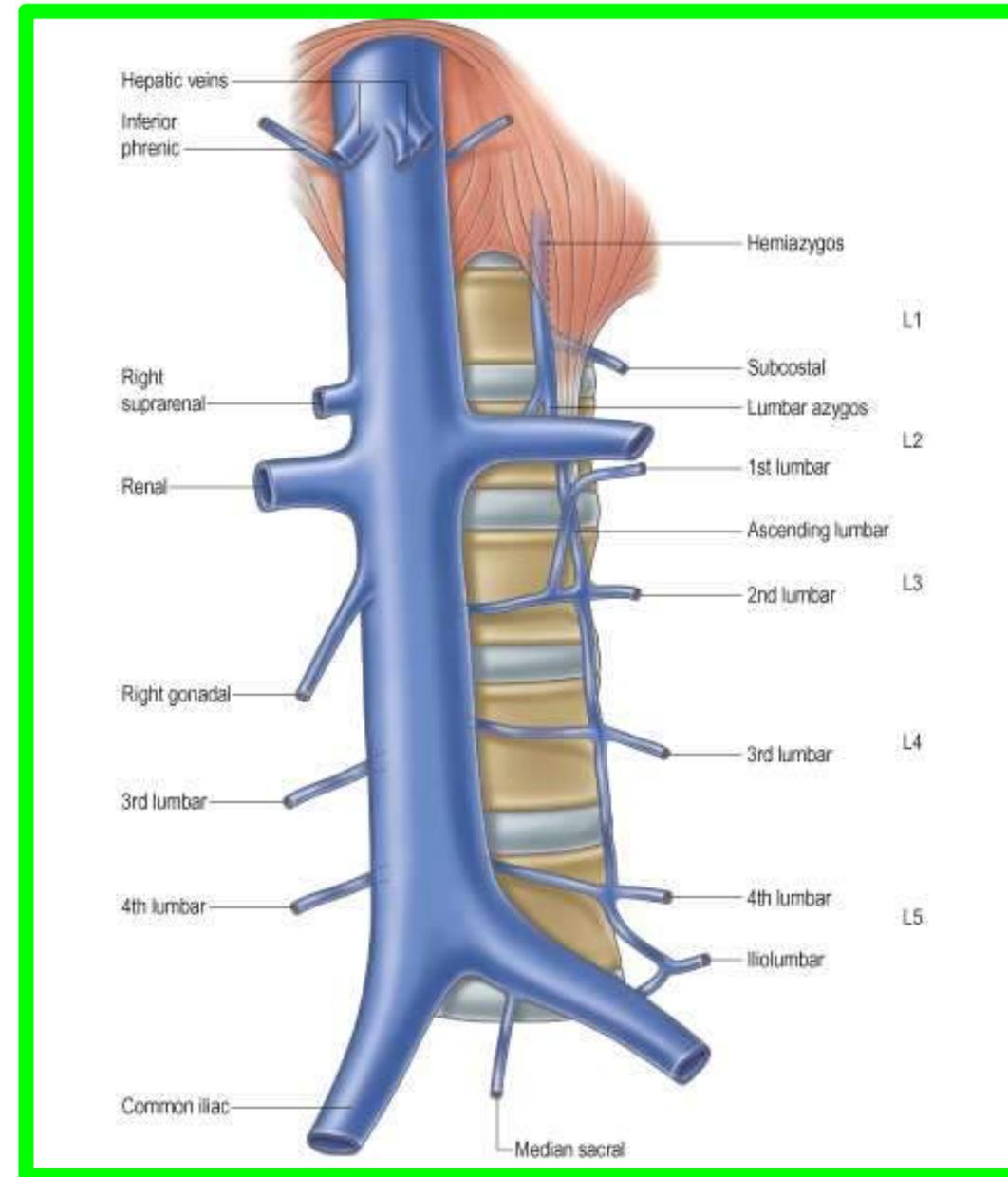
✓ **Right testicular or ovarian vein (the left vein drains into the left renal vein)**

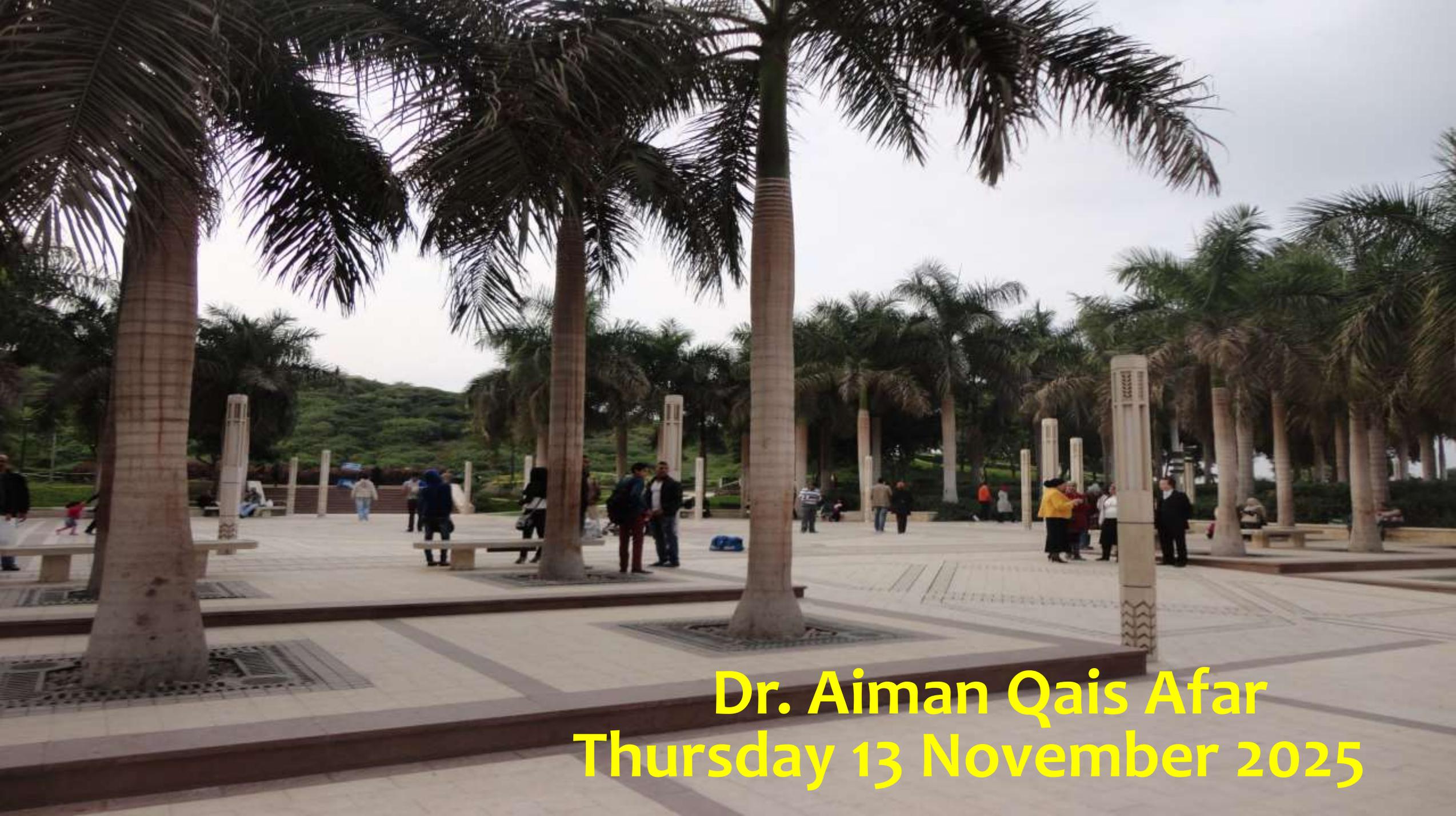


Inferior Vena Cava

✓ **Five lateral abdominal wall tributaries:**
The inferior phrenic vein and
Four lumbar veins

✓ **Three veins of origin:**
Two common iliac veins and
The median sacral vein





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